THE
WEALTH OF INDIA

A Monthly Magazine of practical information and useful discussions

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The Wealth of India.

The object of this Monthly is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensable to statesmen, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

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Current Topics

BY ECONOMICUS.

Management of Indian Finances.

The London *Times* and other hostile critics of the Indian financial management have scored an important point in making Mr. Asquith declare that a stage has been reached in the discussion of the various questions relating to the disposal of India's money in the hands of the Secretary of State and Indian currency in general, when an enquiry by a Committee of experts has become necessary. The real issues have long been obscured by the factions and personal turn which the Tory papers and members of Parliament gave to the whole question by laying particular stress upon the employment of Messrs. Montagu & Co., to make secret purchases of silver for the Government of India and the close relations of the Under Secretary of State with that firm of bullion dealers. Unprejudiced minds in England and out here never lent their countenance to the imputations cast upon the Ministers by their political opponents, though the propriety and advantage of entrusting the work of secretly purchasing silver to Messrs. Montagu & Co. were widely questioned. Indian Financial Management, India's Absorption of Gold and Gold Currency are extremely technical and complex problems, and Indian public opinion upon them is neither clear nor pronounced. Some Indian publicists have definitely endorsed the criticism of the *Times*, others agree with its

correspondent only to a certain extent, while some do not appear to have formed any clear views at all. Anglo-Indian newspapers mirror the feelings of the European businessmen, manufacturers and merchants and these latter having the bulk of the export and import trade and most of the modern Indian industries in their hands, are more directly concerned in the management of the currency and finances by the India office. In a special article, the *Times* recently summarised the views of Anglo-Indian newspapers province by province and observed that though these papers devote considerable space to commercial and financial affairs and their comments afford a valuable index to mercantile opinion, both European and Indian, in the present instance, some of these newspapers, of weight and influence, have been slow to commit themselves to definite opinions upon the many complex questions underlying the problem of India's 'managed currency.' The majority of the European Chambers of Commerce do not sympathise with the agitation against the management of the India office. They do not believe that the present system is, in any way, against the best interests of India. The same appears to be the opinion of the bulk of the Anglo-Indian newspapers. The *Times* of *India* on the Bombay side has valiantly supported the London *Times* correspondent and the Hon'ble Mr. Webb in their condemnation of the India office methods of finance. But the other exponents of Anglo-Indian opinion see no reason to wish for a change in the present system, "pooh-poohing the silly cry that India is being sacrificed to the greed of London bankers." Whatever Anglo-India may think upon the question, India has and must have its own view in the matter. It is the Indian tax-payers' money which the India office handles and it takes pride in manipulating colossal transactions as may be seen from the boast Lord Morley made in that behalf sometime back. The Indian public is therefore intimately concerned in the financial management of the India office and is entitled to enquire if the system is in the best interests of the people of this country. Exponents of the purely Indian view and experts in financial affairs like Sir Vithaldas Thackersey and others have declared their opinions in no uncertain terms and the promise of the Premier in the Commons that a Royal Commission will examine the whole question, will be welcomed in this country, even by Anglo-Indian publicists, who will not be displeased to have a definite pronouncement on it from experts.

It goes without saying that the Commission must be so composed as to include financial experts, British and Indian, and that the Government, and the people of India ought to be adequately represented thereon.

Commons' Debate on Indian Finances.

The long sought opportunity for a full and frank debate upon the financial management of the India office in the Commons was given, but the discussion was not very fruitful. Mr. Gwynne, the hero of the struggle, who, for the past few months, had been hurling volleys of inconvenient questions at the Secretary of State for India, moved a resolution for the appointment of a Select Committee to enquire into the administration of Indian Finance and Currency. Party rather than principle was the key-note of the attack. The contract given to Messrs. Montagu & Co., the close and personal connection between that firm and the Under Secretary of State, the continued absence of Mr. Montagu in this country when he should have been present in the House of Commons, the difficulty of extracting information from the Government, exhausted the chief points in the speech of Mr. Gwynne. The answers given on behalf of the Secretary of State to the various questions put by him and others in the House of Commons, having already furnished the public with detailed information about the purchases of silver, the debate was devoid of anything that was new or illuminating. Mr. Baker had little difficulty in exposing the factious character of the attacks made upon the Ministry. He assured and certainly succeeded in convincing, the

House that so far as the question of an inquiry was concerned, the India office had nothing to conceal and courted the fullest investigation but not a scrap of evidence had been produced to show the necessity for investigation. He made a home thrust at the opposition when he said that by their allegations, they had done a great deal unjustly and unfairly to cast suspicion on the India office. As regards Mr. Bonor Law, he had made that suspicion a cardinal point of party policy, having wilfully perverted the matter beyond all reason. The Leader of the Opposition could not but absolve the Ministers of all suspicion of personal corruption but would not extend to them the same charitable concession with regard to political corruption, designed to strengthen the party machine by patronage such as the one given to Samuel Montagu & Co. who, he thought, should have been the last firm to be employed for the silver purchases. He did not believe that the Government had succeeded in their objects. So far from making a tremendous scoop which they claimed, they had lost money.

In a lawyer-like fashion, Mr. Asquith swept off the immaterial points with which the discussion was crowded and put the straight question whether or not the India Office, when the contract was made, was acting in the best interests of the people and the Government of India. Secrecy, said he, if not essential, was desirable because even if the market were normal, knowledge of impending purchases amounting to six millions would necessarily raise the price. The Premier showed how secrecy had been fruitful of economy and thus silenced Mr. Law's criticism on that score.

Gold Coinage for India.

It has been an open secret for some time past that the Government of India has been in full sympathy with the demand for the making of special arrangements for minting gold coins in this country. This was clear from the views expressed by the Finance Member in the Viceregal Council, when the question was opened there by Sir Vithaldas D. Thackersey. Since May last the proposal of a gold mint in India has been the subject of correspondence between the Government of India and the Secretary of State. That correspondence is now published in the form of a Parliamentary paper and opens with a despatch from the Indian Government, dated 16th May 1912. Before unfolding its present proposal and stating the reasons on which it is based, the despatch briefly summarises the various phases which the question of coining gold at the Indian mints has undergone. It is an indisputable fact that the establishment of a gold currency was regarded as the logical and natural sequence of the closing of the mints to silver in 1893 and as the necessary accompaniment of the establishment of a gold standard in 1899. The idea of minting gold in India is, by no means, a new one. It was recommended by both the Currency Committees and was endorsed by the Government of India. Lord George Hamilton accepted it and requested the Government to make preparations for the coinage of gold. While some progress had been made in this direction, the Lords Commissioners of the Treasury to whom the question was naturally referred, raised various difficulties and expressed their opinion that the proposed arrangement was both impracticable and superfluous. Upon this, the matter was indefinitely dropped. The discussion of the question being, however, vigorously revived and the Government of India being pointedly called upon to take it up, both in the Supreme Legislative Council and outside, Government had to formulate their views and place them in the form of a definite proposal before the Secretary of State.

The Present Situation.

No doubt, the arguments advanced by the Lords Commissioners in 1901 against the minting of gold in India have their force to-day. During the last eleven years, the out-put of the Indian gold mines has not largely increased and it is true that sovereigns are readily imported from Egypt, Australia and England when-

ever the balance of trade is strongly in India's favour. But circumstances have materially changed in India in recent years and the trial of 1907-08 has imparted to the Government of India the lesson that they must vigilantly aim at strengthening their gold position. The apprehensions at one time entertained about the possible popularity of the sovereign have proved illusory and there is strong evidence to prove both the desire of the people for a handier form of currency than silver and their readiness to work with a higher unit than the rupee. It is in this change of the popular attitude to currency matters that the Government of India find the chief justification for reconsidering their future course. The Despatch states and tries to meet the objections that have been urged against their proposal. It is said that a gold currency will be costly entailing, as it will do, borrowings by Government for the purchase of gold, that it will enormously depreciate the value of the ryots' silver ornaments and hoards, that it will necessitate higher taxation, that gold will be hoarded in large quantities and that it will not, in any way, help to strengthen the exchange position. But the proposal of the Government of India is a very modest one and does not involve any of the grave consequences that are predicted. The proposal was and is to open one of the Indian mints to the free coinage of sovereigns, the authorities of the Royal Mint being given such control over the operations as His Majesty's Government may consider to be necessary, the object being to coin sovereigns out of the bullion that may be tendered on the same conditions as obtain in England. There will thus be no borrowings, no forcing of gold into circulation, no withdrawal of silver from circulation and no disturbance of the ordinary course of the usual currency procedure.

Objections Answered.

Apart from the difficulty of the control of the Indian gold mint and the denomination of the coin, various objections have been raised against the very idea of starting a gold mint itself in this country. They may be arranged under three heads. Those who oppose the granting of facilities for the minting and larger circulation of gold coins in India are of opinion that

(1) These measures will be ineffective for the purpose of supporting exchange or of lightening the Government's responsibility for maintaining the convertibility of the present token coinage ;

(2) They are superfluous as without them at present India gets an adequate supply of sovereigns by means of import and that a gold standard can stand without the accompaniment of a gold currency and ;

(3) A gold currency in India will be wasteful and expensive.

To the argument that, in a crisis, gold coins will not be available for export as under these circumstances there is a tendency for them to go to a premium, it may be replied that as the proportion of gold to the total currency increases it will certainly be available for steadying the exchange value of the rupee. As to the imports of sovereigns they depend upon the volume of India's export trade and the Government of India cannot ensure a steady supply of them. Much of the embarrassment of Government will be relieved if a large part of the currency consists of gold coins, which have intrinsic value and are therefore acceptable in international trade. It is said that the gold coins issued from the Indian mint will be melted or hoarded and Government admits that this will be the case to a certain extent. But it believes that a considerable portion will go into circulation which will grow with the people's familiarity with the gold coin. There is no reason to suppose that the expense of refining and minting will be very heavy. On a review of the position of those who object to the starting of a mint for the production of a gold coin in India, the Government of India believe that the apprehensions of the objectors are unfounded. They think that the circumstances of the country are most encouraging and propitious for the proposed measure which will, at least, do no harm. At present there are no facilities for converting

bullion into coin, and if a gold mint is established in the country, there will be every inducement for the public to take their gold to the mint and get it turned into coin. To put it at the lowest, the artificial barrier to conversion being removed, the volume of sovereigns in the hands of the people will swell and their active circulation will be materially promoted.

The Treasury's Reply.

The Secretary of State did not agree with the Government of India as to some of the statements made in their despatch and did not believe that the proposal, if adopted, would be likely to have any considerable effect of the kind anticipated. He thought, however, that the experiment was worth trying if it could be done at a moderate expense or on a self-supporting basis. The Treasury could not accept the proposal, who offered two alternatives, (1) that a branch Mint be started at Bombay solely for the coinage of gold under the supervision of the Royal Mint and His Majesty's Treasury, and (2) the control of the whole Bombay mint be taken over by His Majesty's Government. The alternatives are inconvenient and expensive. If both are dismissed as unacceptable, the Government of India will have to produce a separate gold coin of the denomination of, say, Rs. 10. A gold coin of such denomination has its advantages and has been advocated by some people in India. The Secretary of State is prepared to sanction a separate coin of this kind, subject, of course, to the settlement of details. The sovereign is an Imperial coin while the circulation of a ten rupee gold *mohur* must be limited though it is likely to be more popular in India. Yet the *mohur*, like the sovereign, will have intrinsic value which will depend upon the value of gold. It will be like the gold coins of other nations whose relations to the British sovereigns are governed by the ordinary laws of economics.

Indian Absorption of Gold.

The large absorption of gold by India is causing grave anxiety to bankers in London. Sir Edward Holden has recently been their spokesman. He is of opinion that the increased gold absorption by India is largely responsible for the inability of other countries to strengthen their gold reserves. The complaint is that during the last three years India has taken no less than one hundred crores worth of gold and little of it has returned. If this process goes on, Sir Edward is afraid, a crisis will be the inevitable consequence. The fact of India's heavy absorption is patent but for ought one knows, the circumstances which make it possible may not and cannot indefinitely continue. It cannot be too strongly emphasised that India does not levy an unfair tribute upon any nation which remit the gold to her. The hundred crores worth of gold which India has imported during the past three years merely represent the balance of exports over imports paid for in the ordinary course of commercial transactions. As a speaker at the annual meeting of the Bombay Chamber of Commerce pointed out recently, "it is difficult to imagine on what grounds India's debtors could claim to be freed from their obligation, when we consider that the obligation has been incurred in the every-day business of exchange and barter." The gold was not borrowed to develop schemes in India. During the year 1912, India and Ceylon received only £3¾ millions, out of a total of £210 millions supplied by the United Kingdom for investment at home and abroad. The true remedy for the stringency of gold experienced by London banks does not lie in India but elsewhere. Sir Edward Holden himself and Sir Felix Schuster are advocates of larger gold reserves in the Joint Stock banks. But the proposal has yet to be translated into action and the banks will have themselves to thank if the gigantic superstructure of credit raised upon inadequate foundations of gold, topples about their ears.

Imperial Finance.

Sir G. F. Wilson has distinguished himself as one of the most clear sighted, liberal minded and sympathetic of Indian Finance Members, and his term of office shines out as a clear land mark in the history of Indian finance,

Thanks to the favourable monsoons of the last three years and the opium windfalls which converted an anxious prospect into one of hopefulness and satisfaction, he was able to place imperial finances on a sound and stable basis, and at the same time, to initiate liberal measures of reform in response to popular demand. Mere good luck does not, however, account for the eminent success of Sir G. F. Wilson. Retrenchment and economy wherever practicable and liberal outlay whenever required by the needs of progress, have been his watch words and it is this combination of vigilant attention to economy and readiness to incur reasonable expenditure, that is the secret of the financial achievements of Sir G. F. Wilson. He has indeed exhibited a uniform anxiety to under-estimate revenue and overrate expenditure and levied fresh taxation when it did not appear necessary. Since the first surpluses of Lord Curzon's time an excess of revenue over expenditure from year to year has been a feature of the Imperial budgets. This has maintained taxation at a pretty high level and concealed from the public view the real situation of the country's finance. No one is apparently more conscious of this than the Finance Member himself. His earliest experiences of the position of the Indian Chancellor of the Exchequer were most discouraging and partly explain the nervousness with which he dealt with the finances of India. The gravity of the situation, when he took up the helm of affairs, was so great, he himself tells us in the financial statement presented to the Viceregal Council, that the year 1908-09 ended, not with an anticipated surplus, but with a deficit of no less than $3\frac{3}{4}$ millions. His saying that the Indian budget is a gamble in rain, promises to become proverbial and is a key to his financial policy. His caution was also necessitated by the threatening loss of opium revenue, which has ever been a dark patch in an otherwise sunny landscape. On the question of the increase of taxation which took place in 1910-11 Sir Guy is unrepentant, and in view of the developments that the succeeding years have witnessed, he claims 'to have established without hardship a broader basis of taxation which has been and will continue to be of benefit to the country.' His definition of economy throws light upon his financial policy. "What I mean by economy," says he, "is neither the hasty reduction of expenditure in a crisis, nor the opposition to new expenditure without regard to its character or object. What I mean by economy is spending your money on good objects and getting your money's worth for what you spend." Two years ago, Sir G. F. Wilson essayed to place the provincial settlements on a more permanent basis and he claims to have achieved success in the task though the representatives of the United Provinces and of this Presidency in the Imperial Legislative Council have been pressing the claims of their provinces to a more liberal treatment. The provincial settlements are a gradual growth of many years and though it may be pleaded that they are now satisfactory so far as they go, the powers and relations of the Imperial Government and the Local Governments are such, that no arrangements can become permanent, just, and gratifying to the parties concerned. Under the circumstances, the provinces are not self-sufficient and the frequent 'doles' from Imperial revenues, though they assist the progress of the local Governments, detract from the steady and permanent character of the settlements entered into with them.

Budget for 1913-14.

This state of things is illustrated by the fact that out of a surplus of about $11\frac{1}{2}$ crores which appeared in the revised estimates of last year, about $5\frac{1}{2}$ crores were given away as grants to Provincial Governments which may spend them on schemes of Educational and Sanitary improvement. Last year's budget was prepared for a total revenue of £$79\frac{1}{3}$ millions. But there was an unexpected improvement of £$7\frac{2}{3}$ millions of which £5 millions were secured from opium and railways. After distributing large grants to provinces the

surplus retained was more than £3⅓ millions against a surplus of less than £1½ million anticipated in the budget. Expecting a gradual diminution in the opium revenue, a series of standard figures was laid down some time ago, to represent, year by year, the revenue that would come in from the diminishing trade under normal conditions. This figure for last year was £3½ millions and the actual revenue exceeded it by about £1½ million. Two-thirds of the excess will be retained for the discharge of temporary sterling debt, and thus the Finance Member sticks to his policy of paying off temporary debt out of opium surpluses in opposition to the one suggested by the Hon'ble Mr. Gokhale that we need not be in such a hurry in the matter, and that the funds may be allowed to accumulate. Another source which contributed to the surplus was the railways whose gross earnings were about £4½ millions above the estimate. Our railways have now ceased to be a drain upon the country's resources and have begun to be an important and a remunerative asset. Given a normal season, they are sure to be an unfailing source of revenue provided Government do not yield to the clamour for an extravagant railway programme in years to come. The story of the current year's budget estimate may be briefly told. The Finance Member approaches the task with his usual caution which he feels is necessary in view of the certainty of the loss of the opium revenue and all the uncertainties involved in the probabilities of unfavourable seasons and trade depression. He calculates an aggregate revenue of £82,322,000 and an expenditure amounting to £83,580,000 leaving difference of £1,528,000. This deficit is only apparent as there will be an Imperial surplus of about £1⅓ million and the Provincial Governments will draw upon their cash balances with the Government of India to the amount of more than £2¾ millions. The opium revenue is, of course, dwindling and the proceeds during the current year, from this source are taken at a total of £1,445,000, a decrease of no less than £3½ millions compared with the receipts of last year. We cannot endorse the Finance Member's statement that his estimate of Railway revenue for the current year is optimistic. He estimates that revenue at £36¾ millions as against the £37 millions and more of the year 1912-13. The steadily rising rate of increase in this revenue during the past three years should have justified a larger estimate. The aggregate expenditure will advance from £79½ millions in 1912-13 to more than £83¾ millions in the current year. Sir G. F. Wilson is entitled to take pride in saying:— "In spite of the loss of opium revenue I find it is possible not only to avoid the imposition of new taxation, not only to maintain the present standard of expenditure, but to provide a substantial contribution to meet the ever-growing needs of the country." He has framed his budget on the basis of a 2-crore Imperial surplus. He has allotted one crore for recurring expenditure on education and sanitation, 10 lakhs for agricultural expenditure and an equal amount for medical relief. One more important feature of the budget is the assignments which are made to Provincial Governments to enable them to forego the amounts which are appropriated for Provincial use from the cess on land. In Bombay, the U.P. and this Presidency, the entire proceeds go to the Local Boards, but not so in the other provinces. The Governments there will now be called upon to forego this revenue and the loss will be made good from the Imperial revenues. The Imperial Government will have to make a total provision of nearly 79½ lakhs. This evidences the deep interest which the Government of India takes in the development of local self-government. It may be recollected that the desirability of strengthening the financial position of the local bodies was pressed by Mr. Gokhale on the attention of Government and it is a compliment to him no less than to Sir G. F. Wilson that 'the seeds of policy planted' by the people's leader should have come to such quick maturity.

Indian Finances in the Viceregal Council.

It goes without saying that Indian public opinion ought to be strongly represented on the proposed Finance Commission as the interests of this country are most intimately involved in the investigation. With a view to

impress this obviously reasonable demand upon the Government of India and the Imperial Government, Sir Gangadhar Chitanavis raised the question in the Supreme Legislative Council and moved a resolution requesting that the correspondence between the Government and the Secretary of State be published. The debate upon the resolution brought out a very interesting point. The Government of India have uniformly asserted that their currency policy is sound and requires no investigation. Only recently the Finance Member observed in the financial statement:—"I myself believe that our system of currency and finance in India rests on a sufficiently solid foundation" He, no doubt, expressed the opinion that the system was the subject of many misunderstandings and much misconception and that a commission of inquiry would clear the air and, by increasing knowledge, would diminish criticism. People were, however, anxious to know how the Government of India had suddenly been reconciled to the advantages of an inquiry into their sound system of currency and Sir Gangadhar asked Government to place on the table the correspondence they must have had with the Secretaryof State on the subject. Curiously enough, Sir G. F. Wilson replied that no correspondence could be published for the simple reason that none existed excepting a brief cablegram by which the Government ofIndia were informed of the resolution of the Home Government to appoint a commission. Mr. Asquith's statement in the House of Commons gave one the impression that the question had been discussed with the Government of India before the Ministry decided to appoint a commission. The decision was probably dictated by party exigencies, but in fairness to the Government of India it should have been consulted before the announcement was made. In any case, looking to the clamours that are being raised by London financiers against the Indian absorption of gold and other matters, it is absolutely necessary that Indian opinion ought to be strongly represented on the Commission. Sir Gangadhar did a great service by emphasising this point at the most opportune moment.

Sir G.M. Chitnavis and Imperial Preference.

We regret we cannot pay the Hon'ble gentleman the same compliment on his moving the Resolution on the Indian tariff and inter-imperial free trade. He was indeed on very strong ground when he pleaded for fiscal freedom for the Government of India and a reasonable measure of protection for nascent industries. But he unnecessarily treaded on delicate and debatable land when he sang the praises of the British tariff reformers and their specious schemes of imperial preference. He snould have known that public opinion in this country is not willing to entertain any preference proposals which are calculated to entail great sacrifices upon India without offering her corresponding advantages. He started with the assumption that with the certain prospect of the extinction of our opium revenue, the void created by which cannot be filled from any other source, the Government will be compelled in the near future to impose fresh taxation and suggested that the best available source was import duties which might be enhanced to a sufficient extent. We may, in the first instance, question the correctness of the view that additional taxation may be imperative in the near future. Sir G. F. Wilson has emphatically declared that such a contingency need not be contemplated and that our resources are elastic enough to meet all the strain that may be put upon them. Let us, however, suppose, for a moment that the need for additional taxation arises to-morrow. In that case we agree with Sir G. M. Chitnavis thinking that we ought to be able to put heavier duties upon our imports. This taxation will avowedly be for revenue purposes and the conscience of free traders need not be uneasy. But an outcry will certainly be raised in England against the alleged protective tendency of the enhanced import duties and a complaint about the detriment that will be caused to British industries. The Government of India will be called upon to impose countervailing excise duties upon indigenous products and thus its action will in every way be fettered. Sir Gangadhar was therefore right in insisting that the Indian Government ought to be allowed sufficient latitude to enable it to frame its tariff in harmony with its peculiar conditions and requirements and he would have done better to have avoided the complex question of imperial preference. Even thus limited, the Indian demand for fiscal freedom has little chance of being favourably entertained but it was well that the Indian view was so clearly and definitely put forward in the Viceregal Council.

Special Articles.

IMPROVEMENT OF INDIAN AGRICULTURE.

BY DR. N. KUNJAN PILLAI, M.A., B.SC., PH. D., *Director of Agriculture, Travancore.*

AGRICULTURE in its widest sense includes everything that is connected with the obtaining of produce from the land, whether it be in the form of crops or of animals feeding on grasses and crops grown on the land. Very few in India take such a comprehensive view of this profession. To the Indian farmer, agriculture means hardly anything more than the tillage of the soil and the raising of crops therefrom. He has not come to realise the immense possibilities he has for making money by dairy farming, cattle breeding, poultry farming, bee keeping and such other professions allied to agriculture. It is high time that the Indian farmers take to these diverse agricultural occupations instead of confining their attention to the antiquated systems of land cultivation. Success in farming, whatever be its nature, is possible under modern conditions, only if the farmer carries on his business on scientific and up-to-date lines. His object must be to produce the largest possible yield with the least possible expenditure, and this he can do, only if he brings to his aid the practical experience he has inherited from his ancestors and the scientific knowledge discovered by the scientists of modern times.

Many in this country are inclined to ask whether agriculture has a scientific side at all, whether it is a science that will admit of experimenting and theorising. Agriculture is not a science in the sense that Chemistry or Physics is. At best it can only be looked upon as an art based upon the principles of elementary sciences such as Chemistry, Physics, Biology, etc. This is not the occasion for me to dilate upon the scientific side of agriculture; all that I wish to point out is that it has a scientific side and that this fact has to be taken into cognizance by every practical farmer. With these few general remarks, I shall proceed to show in what directions agriculture in this country is capable of being improved and how the improvements are to be effected.

The first thing a farmer has to do when he begins to cultivate a piece of land is to select the crops to be grown thereon. This is a vital question to which our farmers do not seem to devote the attention it deserves. Even the most experienced men sometimes commit mistakes in this matter, and having done so, they are prepared to advance all sorts of arguments to defend their position. In Travancore, I know of several instances of lands which are best suited for cocoanut cultivation having been converted into paddy fields and *vice versa*. To decide what crops will grow successfully on a particular piece of land, the conditions of the soil, both physical and chemical, have primarily to be taken into consideration. Every crop has its own peculiarities and makes its own demands upon the soil contents, and it should therefore be cultivated on lands possessing the most favourable conditions for its growth. An experienced practical farmer will be able to form an approximate idea of the nature of the land, from its locality and position, the appearance, touch, taste, and consistency of the soil, and the nature of the wild growth it carries. A more accurate method for the determination of the soil characteristics is to have the soil analysed in a chemical laboratory. A careful analysis of soils is useful to the farmer in more ways than one. In the first place, it will enable him to find out what the soils are made of, *i e.*, whether they consist chiefly of clay or sand or a mixture of both. A knowledge of the nature and proportions of the

constituents of the soil is indispensable for the determination of its physical characteristics, such as water absorbing power, water retaining capacity, capillarity etc., which are of vital importance in deciding upon the fertility of the land. The analysis of the soil will also show what chemical substances and how much of them it contains, and a knowledge of these is essential to find out what plant foods there are in the soil and which of them should be introduced into it in the shape of manures. All these are matters of practical importance, though they appear to be somewhat technical, in deciding upon the suitability of a land for the cultivation of a particular crop.

After the selection of the crops to be cultivated, the farmer has to proceed with the preparation of the land, and here we have to consider the question of tillage. For a crop like paddy, the land has to be ploughed over and over until the soil is well loosened and a fine tilth is formed on the surface. Such an elaborate preparation of the ground is essential for the successful growth of paddy. The crop, as it grows, absorbs food stuffs from the soil. Unless the soil contains sufficient quantities of the various plant foods in absorbable forms, the growth of the plant will be checked. The development of the plant depends not so much upon the total plant foods present in the soil as upon the quantities of absorbable stuffs it contains. A soil for example may contain a large proportion of potassiun in the form of a double silicate, but it is useless to any plant unless it is broken up into simpler compounds readily soluble in water and hence absorbable by the plant. The conversion of unabsorbable substances into absorbable forms takes place in the process of what is scientifically known as "weathering" which is brought about by the agencies of heat, water, air, etc. When the ground remains unploughed, these agencies act upon the surface only and consequently the particles of earth below the surface do not get an opportunity of weathering properly. On the other hand, if the ground is well ploughed and if by doing so, the soil is turned over, the weathering becomes more complete to a depth of about 8 or 9 inches of the soil, and the quantities of available plant foods are thereby considerably enhanced. There is an old saying among the farmers in England that a land well ploughed is half manured, the meaning of which I dare say is self evident. What we have to specially bear in mind in this connection is that the land should be *well ploughed*.

The question that naturally suggests itself to us at present is whether the lands in his country are being ploughed well. We must give credit to the farmers for the trouble they take and the expenditure they incur in ploughing their lands over and over again so as to produce a fine tilth. In spite of this laborious process, I am not prepared to say that their lands are being ploughed well. The chief defect in the native method of ploughing is that the soil is not turned over. The plough that is in common use has come down to us as a valuable heritage from ancient times with hardly any modification. Everything around us is changing with the times, but the plough alone remains unchanged for thousands of years. Of all the agricultural implements in India—fortunately there are not many of them—the plough stands most in need of improvement. I do not advocate the introduction of heavy iron ploughs which can be drawn only by two or three pairs of horses, or of costly steam ploughs to be worked by engines. No, what I recommend is a small iron plough which is not too heavy for an ordinary pair of oxen and which is not beyond the means of the small cultivators of this country. I experimented with several ploughs in Travancore during the last two or three years and found that the "Climax" plough supplied by Messrs. Massey & Co., Madras, costing Rs. 8 to 9 and the "Meston" plough supplied by Messrs. Burn & Co., Madras, costing about Rs. 4 to 5 were the best suited for that State, and I dare say that these will be found to suit the requirements of most of the ryots in other parts of India also.

Besides the plough, there are other native

implements which are capable of being improved upon, but for fear of lengthening the paper, I simply pass over them.

The next point that requires consideration is the question of manures. Every practical farmer knows that a land, however fertile it may be to begin with, will get exhausted in course of time, if it is kept under crops year after year, and that to conserve its fertility, it must receive a proper dressing of manures for every crop grown on it. Though the farmer is familiar with this fundamental principle, his ignorance of the details stands as a serious impediment to the adoption of a scientific system of manuring. To do so, he must know what plant foods there are in the land he cultivates and how much of them are available for absorption by plants, and he must also know what plant foods the crop he grows requires and how much of them. These data can in a way be obtained from the chemical analysis of the soil and the crop, and from them, one will be able to find out what substances must be introduced into the soil in order to produce the largest possible yield without materially decreasing its fertility. This is one of the methods of arriving at the scientific system of manuring, but a more reliable and practical method is to carry out experiments in the field with different kinds of manures. The chief ingredients that have to be supplied to the soil in the form of manures are nitrogen, potash and phosphoric acid. Let us for convenience sake denote these by N, K & P. Manures are available in the markets which contain each of these ingredients by itself. To find out which of them must be supplied to a particular land for a particular crop, one must carry out the following experiments. Take eight different plots of equal size and uniform conditions and grow the same crop in all of them, the first plot being manured with N alone, the second with K alone, the third with P alone, the fourth with N + K, the fifth with N + P, the sixth with K + P, the seventh with N + K + P and the eighth without any manure. A comparison of the yield from these various plots will show what manurial ingredient or ingredients must be introduced into that soil for that crop. Having determined this, one must conduct further experiments varying the quantities of N, K, and P in different plots in order to find out how much of these must be introduced into the land to produce the largest yield. Only by such careful experiments can reliable information be obtained with regard to the question of manuring. This is a work that must be left to agricultural experts to be carried out in experimental stations under their special care and supervision. As far as farmers are concerned it is enough if they make practical use of the conclusions arrived at by experts.

Experimental work on manuring is still in its infancy in India; and it will be years before it can come up to the standard attained in other countries. In the meanwhile Indian farmers should turn their attention to the economic ways of using locally available manures. Any one who bestows some thought on this question can easily find out how defective the Indian methods of collecting and storing indigenous manurial stuffs are. The all important cattle manure goes to the land after its chief manurial ingredients have been mostly lost by exposure to the sun and the rain; the urine of cattle which is even more valuable than the dung is entirely wasted; oil-cakes, bones, fish manure, and other easily procurable stuffs are exported to foreign countries; human excreta which in Japan form the principle manure for paddy are here entirely neglected owing to sentimental objections; and the system of green manuring which is very common elsewhere has not yet become popular in this country. There are indeed serious evils in our methods of manuring and their removal should be the first and foremost concern of Agricultural experts and farmers.

INDIA'S GREATEST NEED.

By Rev. G. N. Thomssen, *Bapatla.*

WHAT is India's greatest need? That is, the most important question of the hour. Many are answering the same, but they do not go to the root of the matter. It is not a college education, not industrialism, not commerce, not swadeshism, not the thousand and one things recommended by dreamers that India needs, but it is the realization of the fact that the chain is not stronger than its weakest link and that India, that wonderful chain made up of innumerable ethnic links, is no stronger than the weakest man that goes to make up the nation. All nations, more or less, ignore this fact. That nation is wise which recognizes it and pays more attention to those that are the weakest links in the chain than to those who form its strongest links.

Now the problem confronting all is how can the weak be made strong, how can the submerged masses be made healthy, wealthy and wise? If one would see the possibilities lying latent in the Indian cooly, he must go to foreign lands to which he has emigrated, and there see how the despised and submerged cooly has become an honoured member of society, and how he is becoming rich, not only in worldly goods, but in culture and in all useful knowledge. His children are educated and the former cooly and his descendants become rulers in the new lands, to which they were forced to go either by sore distress in their native villages, or by the misrepresentations of wily recruiters. No matter what extraneous force led them with bleeding hearts to leave their beloved motherland, they soon rose above the surrounding hardships, and, within a few years, became landholders and merchants in the land of their exile, and some of them became very wealthy and prominent. Now what these poor men have achieved in foreign lands they can and will achieve in their home-land if a helping hand is extended to them, and they are lifted out of the mire and misery of poverty and enabled to take a safe and sure stand on the solid shores of prosperity.

Poor people are always a danger to the rich. While I am writing this, I am touring in the richest delta taluq of the Guntur District. This is the harvest seasou. Compare conditions here with those prevailing in the rich agricultural districts of America or Australia. In both lands, when the day's work is done, the farmer goes home to enjoy a well-earned rest till the next day's sun calls him back to the harvest field. He does not deem it necessary to watch his fields. He sleeps in security because even the labourers on his fields are well-to-do and they earn enough to pay all of their living expenses and to educate their children, and their savings do not make them fear a rainy day. The average labourer is content, for probably he owns his own humble cottage-home and he plants enough potatoes and grows enough fruits and vegetables to supply his daily needs throughout the year, and his cow and bees supply him with milk and honey so that he wonders how any one can be dishonest and covet and steal his neighbour's crops. But how is it with the ryot in India? Here in these joyful harvest days, we find that after a hard day's work in the harvest field he must go with some members of his family back to the field and watch his stacks of grain, until he has brought the threshed and winnowed harvest to his home, and has either buried the same in pits or stored it in strong rooms of his house where some one can closely watch the same until he can sell or otherwise dispose of it. Why is such unceasing watchfulness necessary? Because the poor often are thieves. The poor coolies have left their native villages and many thousands of them have come to the rich harvest-fields to work for a little pay—and to steal whatever comes in their way. How can workmen be honest when the price of food is so very high that famine days of old seem like times of plenty to these poor people who are forced by their

unfortunate condition of life to starve or to pilfer wherever they can? Now the greatest need of Indiá is to make these hard-working coolies as independent as they become in foreign lands. Can this be done? I believe it can and the object of this article is to indicate how this can be done.

India is in sore need of labour-saving machinery. This statement does not seem true when one takes into consideration the enormous number of people who are dependent for their very living on the proceeds of their labour. Yet all the work of the land cannot be done by men. An enormous amount of work must be done by cattle such as ploughing, carting, water-lifting, etc. It is very expensive to feed cattle, and labour-saving machinery will be found to be cheaper, quicker and better every way than cattle. Nothing illustrates this fact better than the large number of rice factories that have sprung up like musbrooms in so many parts of the land. Then see the large number of cotton factories where cotton is cleaned and prepared for the market and the mills where cotton is spun. These all do work quickly and efficiently and pay hand over fist for the money invested in them. These factories have taken away the work from thousands of coolies, yet there is not too much labour in the market, for manual labour is in demand for other work and so machines help to do the work that otherwise could not be done, and these machines rather help to increase the earnings of the labourers instead of decreasing them. India is now where European lands were a century ago. The labourers in European lands feared that their earnings would be taken from them by the introduction of machinery, and the introduction of machinery at first caused riots. Mobs destroyed many machines. At present all labourers realize that machinery is a blessing and not a curse to the working men, for they have increased and not decreased their wages. The same will be true of India, for history proves that, what man has always done, he does now, and will do forevermore that which he did in the beginning. Industrial and commercial success always lies along certain well-defined lines of action. But what is the use of machinery, if there is none to work and repair the same? I believe this is the reason why so little machinery is used in India. While the ryot is not too poor to buy agricultural machinery he is too poor to repair it and keep it in order. There is absolutely no reason why there should not be some reaping and threshing machinery in every village of the land, but how to use and how to keep the machinery in repair is not understood by the villagers. Here is one of the largest fields of usefulness for the co-operative societies that are being formed in so many places. Money-lending on co-operative lines is not the only boon that co-operation confers on the people. What India needs is co-operative buying and selling and co-operative working of machinery. Artesian wells are almost unknown in India while the possibilities of artesian wellboring are far beyond the dreams of the most imaginative. In America, Canada and Australia it is quite a common occurrence, that young men pool their earnings, buy an artesian-well-boring plant and go from place to place boring wells and earning large profits. At harvest time hundreds of young men go from farm to farm with their co-operative steam threshing machines, and, by means of their co-operative work earn enough money to secure a college education, and thus they fit themselves for more remunerative occupations, or they invest their earnings in farms or in business and soon they accumulate independent fortunes. This too can be done in India. Money seeks investment and, when those who put their savings into useless jewelry or bury it away in the ground realize the fact that their money, if wisely invested in machinery will bring them great profit, the money will come from many hiding places and will be invested so as to yield large returns. That this is a consummation greatly to be desired none will doubt, but how is it

to be brought about? Technical education and technical education alone can do this. Not the education that Government gives in colleges, but a practical education in every centre where large numbers of people come and go. If there were a good technical school in every taluq town, this problem would soon be solved. In connection with the technical school there must be a good repair shop. In the school the pupils must learn not only the names of tools and the names of important parts of machines, but they must learn how to use tools and how to put machines together and how to repair them, so that they may become the masters of the same. One of the ablest men I have met in India not only studied mechanical engineering, mathematics, chemistry etc., in the colleges so that he might be able to accept a position as teacher of mathematics and mechanics in a Government Technical School, but he also spent five years in the Locomotive works of a large Railway and so thoroughly learned practical mechanics so that now he can not only design but also build and repair locomotives. Such technical education is India's greatest need and when the youth of the land are trained on similar links then, and not till then, will this greatest need of India be supplied, and the weak links in the chain be made so strong that none can break them.

CO-OPERATION IN SCHOOLS.

By M. S. Krishnaswami Aiyar.

THE Co-operative movement which was introduced some eight years ago has met with such phenomenal success that the authorities and the public are making every effort to extend this movement and make it work in the right direction. They are working hard to bring home to the minds of the villagers the principles and practice of Co-operation and are thus trying to elevate the social condition of the villagers. But the introduction of any new reform is often always beset with many obstacles. Old men, especially of the villages, generally have some prejudice or other against reforms of any kind. However good the reform might be they are generally content to follow the old methods which their forefathers adopted. To remove their prejudices is an up-hill task for any public worker and generally he gets dejected at his failure. Of course, in the case of some movements as the co-operative movement, the people have readily responded to the calls of the reformers and the latter are naturally glad over it.

An analysis of the present state of the co-operative movement will surely lead one to the fact that the progress has been rather one-sided. The people have joined the movement simply because they can borrow enough of money whenever they like from the co-operative societies and thus avoid the payment of exorbitant interest to the money lenders which they had hitherto been accustomed to. Beyond the lending of money, these societies, have not been able to make any substantial progress towards the development of Agriculture, Industry, and Trade. Thus, we see that the jubilation of the public workers over the one-sided success of the movement is rather premature. Though these societies afford the villagers excellent banking facilities, the latter have yet to develop their Agriculture and Industry. It is to this aspect of co-operation that the public men should turn their attention. And even if they do, the prejudices of the people are an insurmountable obstacle and it will take a long time before they can be made to understand and realise the benefits of co-operation in agricultural and industrial enterprises.

The young minds of the rising generation have generally no prejudice against new innovations and are ready to absorb new ideas, provided they are presented to them in proper ways. Kindergarten way of teaching and new methods of teaching

History, Geography, Nature study and Languages, have been successfully introduced in teaching young boys, though the old men retain their own prejudices against them. It is to the younger generation that we must appeal for the regeneration of our country, and perhaps, it is with this object in view, the first Provincial Co-operative Conference of Madras (December 1912) passed, among others, the following resolution:—

"That this conference is strongly of opinion that the subject of co-operation should be included in the curricula of studies of elementary schools in the Presidency."

No doubt the resolution is good in itself and when co-operation is introduced in schools we can expect much from it. But, the mover of the resolution made a great mistake in not including in it, the ways and means of introducing the subject in schools to advantage. And it is strange, that the conference, too, did not notice the omission. There are many subjects which have been pronounced by eminent educationists to be very useful in cultivating the mental powers of the pupils, and which have been very much neglected by persons actually engaged in teaching. Nature study which was but lately introduced in Indian schools is considered the best subject that trains the pupils' powers of observation and reasoning, enables them to come into closer touch with Nature and makes them understand and realise the beauties of Nature. This subject along with Geography, History and Hygiene, whose usefulness as school subjects there is no need to explain here, has been treated as optional in village schools. And generally very little attention is paid to the optional subjects. It is possible that, if "co-operation" is introduced in schools, it might be incorporated with the allied subject of History and Civics and be neglected by schoolmasters. It is therefore extremely necessary that the subject of co-operation must be classed with the "General Knowledge" which being a compulsory subject is generally fairly well taught in the schools.

In addition to the danger of the subject being neglected in schools, there is another, a very serious one, which demands our careful attention. Authentic literature on "co-operation" is very scarce in India as the movement itself was only recently introduced, and very few are acquainted with the principles and practice of this new movement. It is therefore very likely that the teachers in village schools and other ordinary writers of school books, will treat the subject in a very unsatisfactory manner and thereby defeat the very aim with which the subject is proposed to be introduced in schools. It is of extreme importance, therefore, that persons who are well acquainted with the subject should write books, pamphlets, etc., which can be safely relied upon as authoritative guides. Sometime ago when Nature Study and Hygiene was introduced in schools, a superior Government medical officer brought out a catechism on Hygiene, had it printed and distributed it among the Government Training Schools. In the same way, the organisers and sympathisers of the Co-operative movement might attempt, in their leisure hours, small treatises, pamphlets, and catechisms and thus supply the educationists with authoritative literature on the subject.

Letters to the Editor.

I.

FOREIGN TRADE AND PROSPERITY.

Dear Sir,—Your contributor in his article in the February number on "Foreign Trade and Prosperity" seems to adduce singularly poor arguments in support of his statements. He says in one place, "In these days we are living on foreign capital .... 219,000,000 Rupees is annually paid as interest to our creditors." If one considers the Balance Sheet of any

firm, it is obvious that the interest paid on the capital is the final item which that firm has to consider in the disposal of its income, and it is moreover a minor item compared with the aggregate of the other portions of the income. The first charge on the income of firms here, whether run by means of home or foreign capital is naturally wages. Raw material, rents, taxes and other similar items are next paid for, all of which remain in the country. Finally, and not till these things have been paid for, is the interest on capital paid by the management of the firm. That interest may go abroad in the payment of foreign capital invested here. I am not disputing that fact, but what I do say is that Mr. Balakrishna forgets the benefit derived by the community through the circulation of the capital in the shapes mentioned above.

He further goes on to contrast various countries with India in the matter of the total Foreign trade of 1903. It is common knowledge, of course, that the average per head of the Indian is infinitesimal compared with the average of other nations. The question is not a comparison in *one* year only with other nations. It is useless to compare the Indian rate per head with that of a far richer country, because the Indian will invariably be worsted. What is wanted is a comparison of the averages per head for India during, say, the last fifty or one hundred years. Then we shall be able to arrive at the true state of things. The question as to the harm or otherwise of India's foreign payments is not to be got at by comparisons of India's trade returns with those of other countries, but by a comparison of her trade statistic's per head to-day with those of the past fifty years or more.

I am, Sir,
Yours, &c.,
T.E.V.

II.

THE STUDY OF ECONOMICS.

[The following extract from a private letter from one of the foremost publicists and economists in India may read with interest —ED. *W.I.*]

DEAR MR. VAIDYA RAMAN—Thanks for your latest number of "Wealth of India" which I always read with pleasure. I am so glad you have poured your heart and soul into economics, the study of which is an absolute necessity for us, Indians, if we are really to make poor India rich. Of course, what is wanted is a large number of workers in each province, earnest and enthusiastic, and above all, industrious and full of intellectual interest. *Practical economics*, in every day life, domestic and commercial, must be watched and the phenomena disclosed carefully noted and studied. I lay great stress on the *practical part*. Theory from classic books on the science is certainly essential for a grasp of first principles. But *deduction* can only proceed on actual facts of a variety of character. Finance, banking, currency and so forth are better understood with practical knowledge. You can then apply the first principles and see also how far Indian economics will *not* fit in with Western economics.

All works on political economy are based by the distinguished writers on their European and American experience. But there has been no reference to Eastern, specially Indian, conditions. With a knowledge of *Indian conditions*, it will be found that some of the first principles may have to undergo a modification.

I am, however, glad that your magazine is appearing, as it is *really a capital Instructor*. And your Madras young men, in my opinion, are keener to study the science, than any other class of young men in India.

The article on Foreign trade and the inference which the writer, Mr. Balakrishna, draws, are very good. And it is good also that Mr. Del Mar contributes so much on the present subject of the "Drain" of gold to India. Your selections are also very good.

You must organise for yourselves. Try to secure the best edited economic papers and magazines from America; also from France and Italy and Germany. Also keep a good look out on new and really instructive works by distinguished writers on Economics. *Bankers' Magazine* should also be indented upon. Of course, I am well aware that all this means *money*. But in undertakings of this character money is essential. If you can collect, say, 500 to 700 rupees every year by small donations from those interested, you would greatly advance the cause you have at heart, and you can also support your Madras Economic Association. The annual publications of the Government of India on Trade, Currency, Railways, &c. are also necessary. *Vital Statistics* might also be now and then treated. They are essential for our wellbeing. Of course, you can lay the foundation stone by stone. You can't rear an edifice at once. You must not forget journals like the *Economic Journal*, the *Royal Statistical Society's Journal*, the *Political Quarterly of Economics and Science*, published by the Columbia University and so on.

The Agricultural World.

Tropical College of Agriculture.

At a fully attended and representative meeting held at the Chamber of Commerce, Colombo, on February 28, under the auspices of the Ceylon Board of Agriculture, it was unanimously decided that the most desirable site for a tropical college of agriculture would be Ceylon, which produces a greater variety of tropical products than any other country in the world. It is centrally situated, and possesses the oldest and best equipped botanic gardens in the Empire at Peradenaya. Further claims for the college being established there, are that Ceylon is healthy, populous and progressive. The claims are to be pressed in the proper quarter.

Selection of Seed Cocoanut Nuts.

It is of paramount importance, says a writer in the *Tropical Agriculturist*, that the greatest care be taken that only the best nuts be got for seed. Time, trouble and expense should not be grudged, for a great deal of the future of the plantation depends on the trees from which the seed nuts have been chosen. It is well to choose nuts from trees ranging from 20 to 50 years of age, that is, those in their very prime. The tree should present a vigorous growth and have large crowns carrying the bunches of fruit on well-set short stems. It is well to avoid those trees that show a tendency to drop their nuts, however large or numerous, and those with scanty or drooping fronds. There is a prejudice in favour of a large sized nut, but medium sized nuts are to be preferred since one has to take a commercial view of the product. Where the nuts are exceptionally large, it follows that there would be fewer on a bunch than where the nuts are of medium size. The difference in numbers when acres are considered will be very considerable, as nuts are sold by the thousand, only very small ones being rejected. In weight, too, if you turn your nuts into copra, there is a great advantage, considering their numbers, in medium over large nuts. It is best to choose therefore medium-sized nuts, globular in shape and with a thin husk and a thick kernel for the nursery.

Profitable Duck Rearing.

Many people have an idea that young ducklings cannot be reared profitably unless there is a pond or stream for them to swim in, but this is altogether a mistaken idea, for when the young birds are being reared for the markets, or for killing purposes, they should not be allowed to go in the water, as they will grow much faster, and fatten quicker, if they do not swim at all. The secrets of successful hatches according to a writer in the *Poultry Journal* are (1) to set eggs from hardy unrelated stock of large size; (2) to make the nests on the ground, so that there is some moisture to soften the inner membrane of the eggs; and (3) to keep the young birds growing from the time they are hatched.

When first hatched, the young ducklings require to be twenty-four hours without food, and then we always find it easier to put water in a saucer and sprinkle coarse oatmeal in it, and little pieces of very fine grit, as they require grit as soon as they are hatched. After this first feed they should have some scalded biscuit meal given them. Young ducklings should be done well and never allowed to get poor, as they are ready for the table when nine or ten weeks old, and for the last fortnight they should have a little hay put into their food, which should consist of ground oats, barley meal, and middlings mixed with milk, and boiled wheat, after they are six weeks, as this makes the skin whiter and improves their flavour.

We may here mention, remarks the writer, that ducklings should never be kept for more than eleven or twelve weeks at the outside, as, if so, they do not grow any larger than they are then, until after they have moulted and got their adult plumage.

Association of Farmers' Institute Workers.

At the sixteenth annual meeting of the American Association of Farmers' Institute Workers, the Committee on institute organization and methods presented a report in which some statistics are given which are summarised in the January issue of the *Bulletin of Agricultural Intelligence.* These indicate the vastness of the farmers' institute work now being undertaken in America.

During the fiscal year ending in November 1911, there were held in the United States 16,741 sessions of regular farmers' institutes. These were made up of 3,539 one-day meetings, 1,942 two-day meetings, and 172 three or more day meetings, representing 7,935 days of farmers' institute work. A total of 2,412,600 persons attended at all the institutes, of whom 995,220 attended upon agricultural trains. The appropriation from all sources of support for the farmers' institutes was $ 445,193.

In many States three or more forms of instruction in agriculture and domestic economy are now being supplied to the people outside the college walls, namely, (1) the farmers' institute proper, (2) the operation of agricultural trains, (3) the conducting of demonstrations, (4) the holding of six-day schools or campaigns, (5) the organization of boys' and girls' clubs, (6) the establishment of the woman's auxiliary as a special feature of the institute work. The farmers' institute proper is but one phase of the general extension movement.

Fundamentally, the farmers' institute is not by nature a well-disciplined school consisting of teacher and taught. Instruction here assumes the form of positive statements, the declaration of established principles and the presentation of material facts of value to the producers of the country.

A successful farmers' institute must accomplish at least four things: (1) yield practical information to those having agricultural problems to solve, (2) define more clearly the farm problems of a community, (3) widen the circle of institute interest and influence, and (4) leave a permanent local organization, club, or institute that stands for agricultural progress.

Thirty-five States have recognized the importance of the farmers' institute work by providing specific appropriations for State support. The amount so appropriated for the past fiscal year aggregated 372,430 dollars.

Climate and Incidence of Disease.

The regularity of the appearance of Rinderpest, Foot-and-Mouth Disease, Hæmorrhagic Septicæmia and Blackquarter have caused erroneous ideas as to the importance of climatic influence upon cattle scourges.

To take the first named, Rinderpest. Its virulence is greatly enhanced at the beginning of the rains, and the conclusion naturally is that the rains are themselves the cause of this. They are, however, only a very subsidiary predisposing cause. The actual cause of rinderpest and all other contagious diseases, of course, can only be the specific organism, but we know, writes Major F. S. H. Baldrey, *in the Agricultural Journal of India*, that by long residence in one place, a contagious disease organism, in course of time, becomes weakened in virulence to the animals resident in that place. So much so that many of them could act as carriers of the contagion without showing any symptoms, and yet if removed to some distant ground would be capable of giving the disease to animals which had not been in contact with that particular race of organisms. That is, what is known as the 'valency' of disease. Such organisms may be comparatively harmless to a herd of cattle in one area, but may be most virulent if conveyed to cattle, the inhabitants of a distant area. It will therefore be seen that movements of cattle are the main agents in the spread of epidemic disease. Cows, non-working bullocks and young stock are grazed in their own villages and surroundings for the cold and hot weather, and it is possible that rinderpest in latent form is with them all this time; at the beginning of the rains they are marched to a more or less distant jungle for grazing on the young grass which springs up

as soon as the rain comes. They there meet cattle from other districts, and each of them in all probability brings rinderpest of a race to which they are immune, but when they come in contact with the strange breed they immediately succumb and may die.

Insect Pests.

The Department of Agriculture in Madras has issued a tiny leaflet stating that agriculturists whose crops may be infested with insect pests may have free advice from the Government Entomologist at Coimbatore. All crops are subject to attacks by insects, which, in spite of their small size, often do great damage merely through their large numbers. A drop of rain is a small thing by itself but, if many drops fall, the land may be flooded and great damage done. So it is with insects: one insect may eat only a few leaves in its whole lifetime, but if innumerable insects attack a field, by their very numbers they may strip every leaf and spoil the crop. Every cultivator knows that insects often spoil his crops and must often have wished to know what to do to prevent this loss. Government have now appointed a Special Officer whose business it is to study insects of all kinds, and especially those which do damage. All cultivators and landholders whose crops are seriously damaged or threatened with insect pests, should write for advice to this officer. It is not always possible at present to suggest remedies for every kind of insect, but in many cases advice can be given or (in bad cases) a qualified man sent to investigate and help after seeing the local conditions. It is generally impossible to advise without seeing the insects concerned. It is useless for a cultivator to write and say " my paddy is attacked by insects ; please tell me what to do "; at least a dozen different insects attack paddy, and it is impossible to tell which is meant or to advise what should be done without knowing what the particular insect is. Specimens of the insects doing (or supposed to be doing) the damage should be sent. It can then be seen what insect is really doing the damage and appropriate measures can usually be suggested. Living specimens of the insects should be sent and they should be put into a tin or wooden box together with a little crumpled paper and sufficient dry leaves or stems of their food plant to serve as food on the journey, and sent by unregistered post. A hollow joint of bamboo plugged with a cork or wooden stopper, makes a suitable receptacle for sending specimens in, if no tin box is available ; but care must be taken that the stopper is secure. All parcels must have the name and address of the *sender* clearly written on them in addition to the address and must be accompanied with a letter giving as much information as possible about the insects about which advice is sought, crop attacked, nature and extent of damage when first noticed and whether noticed in former years, etc. All parcels and letters about insect pests in the Madras Presidency should be addressed to the Government Entomologist, Agricultural College, Coimbatore.

The Economics of Cotton Cultivation.

The Hon. Mr. H. Ledgard, Chairman of the Upper India Chamber of Commerce, Cawnpore, in the course of his very instructive Presidential address at the annual meeting of the Chamber referred to the economics of cotton cultivation in India. He pointed out that in considering cotton cultivation from the economic point of view there are three principal factors which govern its value :—

First, the crop yield, or the number of maunds of *kapas* per acre. This primarily concerns the cultivator, but he is also influenced by—

Second, the ginning outturn, or the percentage of lint available from the *kapas*. It is by this chiefly that the ginner values the crop and it is on the percentage of outturn that he bases the price paid to the cultivator for the *kapas*.

Third, the quality of the product. This is one of the important considerations of the spinner, second perhaps only to the question of the bulk of crop available, which is the great influencing factor in price. Improve

ment in quality can, however, in the ordinary methods of purchase only appreciably affect the cultivator when the crop yield and ginning outturn remain unaffected thereby.

Thus it will be seen that the cultivator of cotton is affected first by the consideration of quantity and only secondly by that of quality. To induce increased cultivation of cotton therefore, and at the same time meet the spinner's need for a good average quality, all efforts must ordinarily be in the direction of increasing the yield per acre, also the high percentage of ginning outturn and while maintaining these, to somewhat improve the staple of the lint.

This may look elementary to some but a realisation of the correct interdependence of these factors is necessary before the sequence of the efforts being made by the agricultural department can be properly grasped.

The cotton spinners require both quantity and quality, the ginner also realises better prices if with quantity can be combined quality but the cultivator is after all the person on whose satisfaction the whole supply of cotton depends, and he gets little or no consideration for quality from the ginner.

This is the position with regard to the great bulk of the cotton needed and used in our spinning mills and the selection of strains, preservation of their purity, aud their gradual improvement by the cross fertilisation of indigenous strains by the agricultural department which has in this direction, already obtained considerable success and will certainly from year to year obtain more and more.

There is however another aspect of the question of cotton growing in India, one which affects the weaving mills particularly, and that is the problem of obtaining a cotton capable of spinning the finer counts, in other words, a substitute for American cotton. Here the question of quality and of long staple is the great desideratum and here too the department has not been neglectful.

Green Manures.

The average Indian ryot has not yet come to that stage of economic development when he can freely buy and use the artificial manures which are so largely used in England, and other countries in the West. As yet the cheapest plan for him is to raise his own manure by sowing leguminous crops and ploughing them in time into the soil. There are one or two important points in applying green manures, which the ryot will do well to note if he is not to be disappointed with the results of his labours.

In the first place, it must be borne in mind that the potash and phosphoric acid which green manures contain is obtained from the soil on which they are grown, and in consequence no enrichment of the land in this respect is obtained. All that happens is that the potash and phosphoric acid present in the soil is taken up by the green manure crops and again returned to the land, but in a condition to be readily absorbed by the main crop which follows. Now as the practice of green-manuring leads to heavier paddy crops, it follows that ultimately more potash and phosphoric acid is removed from the soil than would otherwise be the case, and the land in consequence will all the sooner be impoverished with regard to these two manurial ingredients. Provision must, therefore, be made to supply these ingredients to the land in the course of time, and this is done best by occasionally dressing the soil with such manures as super and bone-meal which are very rich in phosphoric acid, and more occasionally still with wood-ashes, sulphate of potash, etc., manures which are rich in potash. The point to be remembered is this, that green manures are not complete manures, as they bring only nitrogen and humus to the soil.

Another point to be borne in mind in regard to green manures is that, the older the vegetable matter the richer it becomes in ligno-cellulose and consequently less adapted as nutriment for the azotobacter. On the other hand, green stuff, and in a lesser degree roots and straw, contain substances which are easily hydrolised into forms adapted

to consumption by bacteria. There are further other micro-organisms in the soil which prepare nutritive material for azotobacter, and there is a whole series of enzymes that render carbohydrates soluble.

Of all the substances, green stuff is the best nutritive medium for the development of bacteria; in it they find, in favourable proportions, carbohydrates and nitrogen; besides, the carbohydrates are in a form which is more easily transformed by the enzymes contained in the bacteria themselves. Consequently green manuring increases the activity of bacteria, it causes a more intense respiration, it raises the temperature of the soil, while the greater development of carbon dioxide favours the porosity of the soil and in union with water facilitates the disintegration of insoluble phosphates and silicates.

The Question of Soil Fertility.

The term "Soil Fertility" cannot be said to have any definite significance, since it can only be employed to denote a relative condition. For instance, a virgin soil with only a very small proportion of available plant food may, through the activity of bacterial life present in it, be highly nitrified and fertile; and yet it will become useless after a couple of crops have been taken off it. An analysis, to be of value, should indicate the total amount of mineral plant food in the soil rather than the measure of fertility which depends, so to speak, on accidental and variable circumstances, and is obtainable without any great difficulty by artificial means.

The hydrochloric acid method of soil analysis is useful in this respect, in that while it gives no true indication of immediate fertility, it is a guide to the total reserve of plant food which can be made available through a comparatively long space of time.

The difficulty in ascertaining the immediate fertility of a soil is in discovering the solvent which most nearly approaches the action of plant roots. There is present in most soils a certain proportion of plant food that may be said to be ready for root absorption, but the bulk of it awaits the solvent action of the roots.

Different chemical compounds respond differently to a particular solvent agent, and different agents act differently on a particular chemical compound. This is a common experience in the use of re-agents in the laboratory.

The action of carbonic acid and other solvent substances present in soil water is sufficient to bring about the solution of certain compounds, but not of others. The solutions of the former that are found in the soil will be available to plants, but compounds of the latter type demand the action of what is known as the "acid sap" of the roots.

If the exact composition of this acid sap were ascertainable there would be no difficulty in imitating its action in the laboratory and so discovering the so-called "soluble plant food" in the soil.

There is good reason to believe that the acid sap of plants is not of uniform composition, that is to say, that it is not of the same character in the case of all plants; and this fact serves to complicate the work of chemical analysis made with the object of ascertaining the proportion of soluble plant food, or determining the measure of immediate fertility. The action of strong acid such as hydrochloric acid can in no way be compared to the action of plant roots. A proper soil map should not be based on considerations of immediate fertility, since, as already pointed out, many soils, may be very fertile for a short time only and then become exhausted. Closely connected with the question of fertility are the mechanical character of soils and the meteorological conditions prevailing in the districts in which they occur; but the element which has the most important bearing on this question is the biological relations that exist in the soil.

These considerations have been forced upon us by a perusal of a valuable paper by Dr. Jensen of the N.S.W. Department of Agriculture. Himself a chemist, the author fearlessly states that though he at one time ex-

pressed a belief that chemical analysis of soils would be of direct value to the agriculturist, subsequent research has convinced him that he was wrong. In certain cases an analysis is of help to the expert, but in the generality of cases instead of being a guide to the person who is in quest of a suitable manure for his crop, it is a delusion leading him to useless expenditure. Many soils which are low in lime and potash are really rich soils, and many others which are apparently rich need manure badly.

Soil analysis by the official method while misleading to the layman has, however, this advantage, that when analytical results are considered carefully in conjunction with such matters as depth of soil, mechanical condition, climate, topography, etc., it aids in judging of the potential fertility of soils. But it is only an aid, and it is very often the case that without it an experienced person is able to pronounce an opinion, after a few minutes' inspection and manipulation of the soil, more definite and correct than that expressed after a complete and tedious chemical analysis.—*Tropical Agriculturist.*

Agricultural Improvement.

In the Bengal Provincial Conference which was held at Dacca on the 24th March, the Hon'ble Babu A. C. Roy, Chairman of the Reception Committee, referring to agriculture observed : There is one other question, which to my mind, is of the utmost importance in the present state of our country. And I beg leave to draw your attention to it. That question is the improvement of the agricultural resources of our country. If India is admitted to be principally an agricultural country, I think, I can safely assert that Bengal is essentially so. I believe, the best part of its income from all sources is derived from land and the largest portion of its population depend upon land. And since our industry, trade, and commerce of old time have gone down very low, have indeed approached towards a vanishing point, a large portion of the population of Bengal, which depended for its livelihood on those sources of income, has been obliged to fall back upon land. The population of the country has increased enormously ; but there has not been a proportionate increase in the area of productive land. Over and above this, the addition of the consumers, who were formerly maintained by industry, trade and commerce, has very much increased the burden on the land. Therefore, unless the productive power of the land be increased and unless the land can produce more valuable crops, we are done for. Situated as we are, the time is far distant when we may reasonably be expected to make good the deficiencies by income derived from industry and commerce. The knowledge, training, and experience required, the outlay necessary, the risks to be provided for, and last though not the least, the competition to go through, all combine to make industrial and commercial enterprises assume a forbidding appearance. Small undertakings in these lines do not and cannot pay. And we know that we, Bengalees generally, have not yet been able to make any headway in these lines with small capital. Then again, some of our attempts have been throttled and smothered by foreign competition. My own idea is this, that industries and commerce in their infancy require help from the Government of the country which I am sorry to say we have not to the extent we wish for. On the other hand, the capitalists of our country are not very willing to come forward to deal with several unknown factors and risk money in the experimental stage. For these reasons, amongst others, I beg to enlist your sympathy and energy for the development of the agricultural resources of our country. Very large capital is not necessary and very large risks have not to be undergone. The plants and implements required are neither complicated nor many. The training and experience necessary for this are comparatively small, and Government help, in various ways, is, I presume, obtainable more easily.

With the question of agriculture is intimately connected the question of the improvement of

cattle. And this reminds me of one of the several most important Resolutions moved by my Hon'ble friend Mr. Chakrabarty the other day in the Provincial Council. It was for providing pasture land for cattle. Every one of you, ladies and gentlemen, is aware of the deteriorated condition ofour cattle, the scarcity, and high price of pure milk and its products in this country. You are also aware in what deplorable condition the cattle are kept during the rains, and how these eke out their existence during the dry season. In olden times every village had its public pasture grounds, and now that we are more civilised our cattle are worse off than those in the less civilised parts of the country, such as the Sonthal-Perganas, where every village has its public pasture land. Want of pure milk acts prejudicially upon the health of our infants and, I believe, this one fact alone accounts for enormous infant mortality and weakly youths. Development and improvement of our agriculture are likely to enlist the active co-operation of the youngmen of our "bhadralog" class and provide occupation and employment for many, who are now unemployed. This in itself is a matter of great importance. I hope a time will come ere long when a Brahmin boy will unhesitatingly follow the precepts of our old law-giver Manu and prefer cultivation to service and manual labour will not be looked down upon with contempt.

Selection of the Sugar-cane.

It is a fact long deplored that India which has excellent facilities for growing sugar-cane should import large quantities of sugar from Java, Mauritius and some other places abroad. The causes which contribute to this melancholy feature of Indian trade are many and one of these is certainly the want of adequate knowledge and care in the selection of the cane for cultivation.

Mr. Francis Marshall has an interesting article on the subject in the *Bulletin Agricole* of Mauritius in which he refers to the subject of disease and of the re-generation and amelioration of the plant. After considering the various methods of selection, he advises the selection of cane cuttings in the following manner:—

At the time of harvesting, vigorous and sound canes are selected, according to their general appearance. Canes which show the slightest symptoms of disease or abnormality should not be considered.

From these selected stalks, tops composed of 10 to 12 joints are cut, and transported to the selection shed. Subsequently a selection of mother stems and shoots is applied. This, naturally, should be entrusted only to experienced eyes ; even their mistakes are frequent. In dubious cases, for instance, when the shoots resemble the mother stem we take them too, on the basis that they have grown under the same conditions, and are therefore of the same constitution.

The stalks are separated from the leaves and again cut, stopping where the leaf gives some difficulty in separation (near the top part), where its removal would harm the eye. This operation should be performed with great care and entrusted to reliable people. As it is of primary importance, in many respects, that the end should be clean-cut and not shattered, it is very important that the part left between the cut and the end-joint be undamaged. This is the weak point of the cutting, and the road by which parasitic fungi and all sorts of insects may attack the cane. Moreover, if the cut is not a clean one, decomposition occurs, and if the shattering is considerable, such decomposition will extend to the bud and cause its destruction. The second stage now begins. It is based upon.

SPECIFIC GRAVITY.

The selection shed is composed of two departments. In the former of these, mother stems are treated ; in the latter, shoots. The method of treatment in either department is the same. Each department has a set of three tanks, containing solutions of molasses of varying density. The first tank contains a solution of high density ; this density is gradually lower in the second and third tanks in each department. In

these tanks the specific gravity of the tops under selection is successively tested by a simple process of immersion into the molasses solutions. The lighter tops will float at each stage; the heavier ones will sink. For purposes of brevity, the former will be termed *floaters* and the latter *sinkers*.

The object of this operation is to make specific gravity the second factor of selection, since, as already stated, the specific gravity of the cane is under normal conditions proportionable to its sugar content. In addition it serves as a test of the soundness of tops, since it is proved that the attacks of many diseases produce the effect of diminishing the specific gravity of the cane.

As stated above, the molasses solution in the first tank has the highest density. When the tops have been immersed into this first tank, the sinkers, which obviously are those tops whose specific gravity is superior to that of the molasses solution, are at once set apart for planting.

The floaters from tank No. 1 are now sent into tank No. 2, containing a solution of inferior density to that in No. 1. Again the sinkers are set apart for planting, *separately from the sinkers from No.* 1, and the floaters are transferred to tank No. 3, where the solution is of still lower density. Finally, the sinkers from No. 3 are reserved for planting, *separately from those from Nos.* 1 *and* 2, and the floaters, which have evidently a low specific gravity and are therefore unsuitable for selection material, are sent off to the mills to be crushed.

In Java practice, the difference in specific gravity between the several tanks is generally taken to be 4° Brix. The question of determining the minimum density of the solution to be used for purposes of ultimate elimination in the last tank depends upon the peculiar circumstances of each estate, and varies especially according to the more or less abundant supply of tops available. For instance, it stands to reason that an estate having at its disposal only a limited supply of tops will use a final solution of lesser density, in order not to be obliged to eliminate too large a number of floaters, as it might otherwise not have enough left for selection after the density test.

In Java practice, the density of the final solution actually ranges from 6° to 10° Brix. Shoots, as already stated, are treated in the same way as cuttings from mother stems, but in a separate department.

TREATMENT OF SINKERS.

It now remains to be stated what should be done with the several lots of sinkers, which form the selection material. As these have more eyes than are necessary for planting, they are cut to the required number of eyes. In Java, the practice is to plant five eyes in some estates, on others three. It must be well borne in mind that, in Java, we deal exclusively with virgin canes.

The cuttings are now plunged into a solution of *Bouillie Bordelaise*, well-known to planters, and are thereafter ready for planting.

The whole of the operation (from the harvesting of the stalks to the departure of the selected planting material from the selection shed) must not exceed 48 to 60 hours.

A matter of great importance is the method of planting and treatment of the various planting material obtained from the sinkers in tanks No. 1, 2 and 3 respectively. The great object of the selection should now be to give each category a fair chance in the struggle for existence. They should not therefore be planted indiscriminately; it is obvious, for instance, that a cutting from a sinker from No. I tank being constitutionally stronger than one from No. 3, would, if grown in its vicinity, absorb nourishment to the latter's detriment and warp its growfh. The various categories of selection material should therefore be planted on separate plots, and each enabled to thrive under the most favourable conditions.

The Co-operative World.

Share-milking.

Share-milking in New Zealand has proved itself to be a most satisfactory system. It is an arrangement made between the farmer and his milkers on the co-operative basis of an equitable division of the milk, calves, and pigs, in proportions varying according to the quality of the land. The farmer provides the land, stock, houses, and necessary buildings; the milkers provide the labour and, in most cases, their own horses, wagons, and cans, and pay a proportion of the cost of hay and other winter forage. The system finds favour with the farmer, who is relieved of all labour responsibilities, while the milkers, and especially those married couples who have strong, healthy families able to help in the work, can earn good wages with free house, garden, milk, and grazing for horses. Many families, after a few years of share-milking, have purchased farms for themselves out of their savings.

Credit Banks for Agriculture.

England is a long way behind the countries on the continent in the matter of providing cheap capital for the agriculturist. The fact is, in England, large farming is the rule, the small farmers in need of money being few. However the financing of the farmer has just been taken on hand ; We gather from the *Economist* that as the result of negotiations with the joint-stock banks, the President of the Board of Agriculture in England, Mr. Runciman, announced that a majority of the leading institutions had expressed their willingness to enter into business relations with registered co-operative credit societies. They would receive their deposits allowing them as high a rate of interest as circumstances would permit, and would give favourable consideration to applications for advances. Such loans, if granted, would, though nominally repayable on demand, be allowed as a general rule to run for periods of twelve months at a fixed rate of interest, being then subject to renewal, reduction or repayment. The banks would also encourage the managers of their country branches to assist in the formation and advise in the management of registered societies, and permit them to undertake the post of unpaid treasurer to such a society, provided that did not involve membership of the society.

Use of the Word 'Co operative.'

A Notification (No. 1009 M. R., dated the 5th March, 1913), issued by the Government of Bengal states:—"Notice is hereby given that, under sub-section (1) of section 47 of the Co-operative Societies Act, 1912 (II of 1912), no person other than a Co-operative Society registered under that Act may in future carry on business under any name or title of which the word 'Co-operative' is part, without the sanction of the Local Government, and that, under sub-section (2) of the same section, whoever infringes this restriction will render himself liable to a fine. Under the proviso to the said sub-section (1) of section 47, the aforesaid provisions of that section do not apply to the use by any person or his successor in interest of any name or title under which he traded or carried on business before the 1st March, 1912." A list, so far as is known, of the concerns in the Bengal Presidency, which used the word "Co-operative" as part of their name or title before the 1st March, 1912, and consequently exempt from the provisions of section 47 of the said Act, is given and any other persons claiming exemption on this ground are required to communicate with the Registrar of Co-operative Societies before the 31st May 1913.

Money-lenders and Credit Societies.

The principal requirements of village co-operative credit societies to ensure success seem to be three, namely, (1) a sound system of finance; (2) efficient supervision, and (3) a drastic means of dealing with defaulters without recourse to the civil courts. As regards the first of these requirements, *i.e.*,

finance, a great deal still remains to be done. Although Government and enlightened zemindars may be ready to advance loans to societies, the situation becomes different when the financing is left to private enterprise. Security and fixed dates for repayment are required by business firms. At present "a society even when fully financed is liable to visitations of flood, blight or famine which may demand the urgent provision of fresh emergency capital and if members cannot get it promptly from their society they have no alternative but to go back to their mahajans." This raises the very interesting question of how far the local money-lender or mahajan should be eliminated. Is it advisable to completely destroy his business ? Can he not in some way or other be brought into the scheme? Many a time and oft, respectable mahajans have saved their clients from absolute ruin by timely advances of the necessary cash. Interest, of course, was high as security was bad. We do not defend, says the *Pioneer*, the worst type of money-lender, but most experienced officers will be ready to admit that there is a class of highly respectable money-lenders whom the villagers themselves think highly of. Surely any sound system of financing village societies should not ignore the village money-lender unless there are special reasons for wishing to overthrow his credit. If the money-lender is treated harshly, and if by any chance the villagers are obliged to turn to him for help in some calamity, they may rest assured that they will have to pay dearly for their previous treatment of him. This is an important matter and will assuredly not be overlooked by Government.

The Madura-Ramnad Conference.

A very successful conference of the Co-operators in the Madura and Ramnad districts was held on the 22nd and 23rd March. The Hon'ble Mr. P. S. Sivasami Aiyar, B.A., B.L., C.I.E., Member of Council, Madras, delivered an interesting address, extracts from which are given in this issue. Three special features of this conference deserve to be noted. The first and foremost is the very large attendance of non-Brahman delegates. Out of 148 delegates who attended, only 38 were members of the Brahman community, the rest being non-Brahmans, of whom 43 were Kallars, 11 Christians and one Panchama. It is a specially striking feature of this Conference that a Panchama delegate attended it. Not merely did he attend it, but he also took an active part in it.

The next feature is the comparatively small number of resolutions invoking Government help. Of the seventeen resolutions passed there are only four in which help has been asked for. One is the opening of an experimental farm, another, the appointment of an agricultural inspector, the third relates to the supply of Government publications, the fourth to the opening of primary schools and to the importance of including the rudiments of agricultural education as an item in the curriculum of studies. This attitude of self-reliance and independence will no doubt be noted with interest by Co-operators elsewhere in India.

The third point is the ambitious nature of the programme sketched in the resolutions. They cover almost every phase of co-operative activity. A high ideal though seemingly impractical has yet certain decided advantages. As observed by the Hon'ble Mr. Sivasami Aiyar in his concluding speech, "in the beginning it may probably strike many of you as too large a programme to be realized in the near future. But I for one am rather disposed to agree with the gentlemen who have drafted it. I believe these resolutions will not be mere pious aspirations but will have an effect on the conduct and actions of many of you. They ought to be repeated in season and out of season as they deserve to be. I believe in high ideals. It is only by persistent preaching of the ideal that you can ever expect to materialize it into the actual."

Co-operative Societies in the Punjab.

It appears from the Report on the working of the Co-operative Societies in

the Punjab for the year ending 31st July, 1912, that an organized effort was made during the year to extend to artisans, and especially to weavers, the advantages of co-operative methods. Fourteen more societies of this class were registered during the year and 11 others started which have not yet been registered. The difficulties to be faced, especially in the case of weavers, are much greater than in the case of agriculturists' societies, inasmuch as the weaver is much more downtrodden and consequently, more suspicious and less enterprising. "It is necessary to remember," writes the Registrar," the obstacles which had to be overcome before village societies achieved success among agriculturists, and not to feel disappointment if the weavers are slow to move. We are furthermore, in the case of the handloom worker, confronted with the possibility that his industry is doomed, and that we are perhaps fostering a hopeless cause. Whether this is true are not, it is, I think, our duty to improve the present deplorable condition of this oppressed but patient class, and such experience as has been gained certainly holds out some hope of success. There is still a good demand for hand woven articles, and if the economic condition of the handloom workers is improved it will be possible to raise the standard of his work. Our efforts during the past year have been to make the weavers in a few societies independent of the blood-sucking middleman. The societies have purchased their own yarn and made some profit thereby, and have also been helped in the disposal of their woven material. This last business is really the crux of the situation. The best course appears to be not to form too many societies, but to make successes of those which have been started. After that has been done many more can be formed on the same model. The 13 weavers societies have a share capital of Rs.13,957 and had a turnover of about Rs.43,639 during the year.

Two good shoemaker's societies and two promising societies of carpenters and blacksmiths have been started and, as soon as a scheme of industrial education is ready, a beginning should be made in these four societies. As an instance of the profit made by the middleman, which the members of a society can appropriate for themselves, may be mentioned the small society of shoe-makers at Ludhiana, which on a share capital of Rs. 248 has earned a profit of Rs. 217 in the space of $4\frac{1}{2}$ months. The Maghiana artisans society, which is mostly composed of carpenters and was started last year now shows a profit of 22 per cent."

Progress of Co-operation in Germany.

According to the Report of the National Federation of German Co-operative societies for the year 1911-12, there were in Germany on June 1st,1912, 26,026 agricultural co-operative societies. This figure represents about 79 per cent. of the total number registered. The average number of members in rural societies is much less than in urban. Whilst in the country most of the societies have less than 100 members, in the towns those with more than 100 members form the great majority.

The total number of members in those 26,026 societies is calculated at 2,430,000. This is certainly in excess of the real number of farmers who belong to co-operative societies, for those belonging to more than one society at the same time are counted more than once. It shows, however, that agricultural co-operation is already very widely spread in Germany, although there is still room for additional progress in the matter.

The following table extracted from a recent issue of *the Journal of the Bureau of Economic and Social Intellegence* gives the number of agricultural co-operative societies in Germany at different dates:—

Co-operative Societies.

Date.	Co-operative Societies.				Total.
	Loan and Savings.	Purchase.	Dairy.	Misellaneous.	
July 1st. 1890 ...	1,729	537	639	101	3,006
" " 1895 ...	4,872	869	1,222	207	7,170
" " 1900 ...	9,793	1,115	1,917	811	13,636
" " 1905 ...	13,181	1,867	2,832	1,443	19,323
June 1st, 1910 ...	15,517	2,280	3,333	2,715	23,845
" " 1911 ...	15,990	2,346	3,415	2,973	24,724
" " 1912 ...	16,774	2,417	3,475	3,360	26,026

We see from this how immense has been the progress made by Agricultural co-operation in Germany in twenty years. The increase in the number of societies was particularly large in the year 1911-12.

It is due in the first place to the serious losses suffered by German agriculture in 1911 through drought and cattle disease. It is, in fact, in years of calamity that farmers learn to appreciate the benefits of co-operation.

The Co-operative Movement.

The following are extracts from the Presidential address of the Hon'ble Mr. Sivasawmy Aiyar, C. I. E., at the Madura-Ramnad Co-operative Conference.

PROGRESS OF THE MOVEMENT.

The movement was started only about nine years ago. The success which it has already achieved has been such as to convince all impartial observers that it has taken root in this country, and that there is every promise of vigorous growth in the future. Wonderful has been the growth of the co-operative movement in this Presidency; the Districts of Madura and Ramnad need not in any way fear comparison with the other Districts in regard to its progress in these parts. I find that about 109 Societies have been started in the Districts of Madura and Ramnad together, and that, out of these Societies, a great many have been ormed in tracts which might, at first sight, have appeared to be unpromising; and out of material, which might have struck an outsider as intractable. It cannot but be gratifying to all observers that so much has been achieved with such unpromising material.

THE BENEDICTION OF THE GOVERNMENT.

To the inhabitants of these Districts belongs the credit of having started a District Co-operative Bank—a Bank which, unlike other Central Banks, has attempted to combine the two features of financing and controlling the Societies, which form the integral parts of it. You are probably aware that this combination of features has already received the benediction of the Government in the review which was published recently upon the Report of the Registrar of Co-operative Societies. We have expressed the hope that this Co-operative Bank may serve as a model for similar Co-operative Banks in other Districts to finance and control other co-operative institutions which may be represented in the Central Banks.

JOINT-LOAN TRANSACTIONS.

Another feature which I notice as peculiar to the co-operative movement here, is a feature which has been developed in a Society formed at Othakadai, where the system of joint-loan transaction has been initiated. The object of this joint-loan transaction, is, I understand, to enable groups within the Society to be formed for the purpose of raising more credit. As a rule, our Co-operative Societies have been formed for the purpose of obtaining credit; and the combination of co-operative production and other forms of co-operation among the members of these Co-operative Societies has not always been practicable hitherto. But it has been found to be quite practicable for a smaller number of members to combine together for the purpose of co-operative production or co-operative supply or other similar purposes; and it is to encourage combinations of this sort, as a first step towards co-operative production on a large scale, that this system of joint-loan transaction has, I understand, been started; and so far as I can see, this is a feature which is peculiar to the Society at Othakadai, which has been formed in this District. I am not aware that any other District has so far developed this feature of co-operation.

THE NEXT STEP.

Now, having already accomplished so much, it remains to consider what should be the next step to be taken. In the natural course of evolution, co-operative credit has been the first form of co-operation to be undertaken. I remember reading a passage in Mr. Wolf's book, where it is said that if Sir Horace Plunkett had to begin co-operation in Ireland he would begin with the starting of Co-

operative Credit Societies, and it is only consistent with the fitness of things that co-operative credit should take precedence over other forms of co-operative movement. The first object of the Co-operative Societies must be to redeem the ryots from their heavy indebtedness to the usurers, of the village or the town. Once that task has been fairly accomplished, it is necessary to consider what further step should be taken towards the extension of co-operation in other directions.

CO-OPERATION IN AGRICULTURE.

Co-operation in the matter of agriculture must undoubtedly be the next move, and I find on going through the programme of work to be placed before this Conference, that a prominent place is given to the extension of co-operation in the field of agriculture, and I cannot conceive of any more useful form of co-operation, one more likely to be attended with permanent benefit to the people. Co-operation in agriculture has been found necessary even in European countries. On the Continent of Europe, the number of Co-operative Agricultural Societies is counted by thousands. In Ireland, there is an immense number of such Societies. There is an awakening on the part of England to the needs of co-operation in the domain of agriculture. If it has been found necessary even in the countries of the West, where holdings are fairly large in size, and where the farmer comparatively commands more capital, how much more necessary is it in our country, where the system that obtains is the ryotwari system with its innumerable small holdings and peasant proprietors? The extent of our individual ryotwari holdings will, I imagine, be found to be very much less than the extent of peasant holdings in the countries of Europe; and with such small holdings, there is no surer remedy than co-operation; and the only way by which our ryots can improve their economic position and attain prosperity is by learning the use of combination among themselves.

MORAL EFFECT OF CO-OPERATION.

It must have an enormous effect morally as well as economically. The moral and intellectual effect of co-operation has been abundantly made manifest even in the sphere of co operative credit. But it is found to be much greater in the field of co-operative agriculture or co-operative production. It is bound to quicken the intelligence of the ryot to enable them to find out the conditions of the market where he has to obtain his necessaries or dispose of his supply. It must enable him tofind out the difference in the quality of things which he has obtained for carrying on his operations. It must stimulate him to produce a better quality of articles than he has hitherto produced, and it must in various other way, have a profound influence upon his character. Instead of looking upon his neighbours in the village with any feelings of jealousy or hatred, he will learn to look upon them as friends and partners. I have no doubt that the progress of co-operation will tend to put down the spirit of faction and quarrel and all kinds of feuds in the village. I feel sure that if co-operation be applied in a larger sphere, and for a variety of purposes, the ryot will become a much more refined and useful being than he is. He will cease to find pleasure in litigation; he will be able to devote all his time and all his energies to the improvement of his lands and to the promotion of the material prosperity of the country.

BENEFITS OF AGRICULTURAL CO-OPERATION.

There is a very large scope for co-operation in the field of agriculture. To speak of one very profitable application of co-operation, an application which has already been carried out, I understand, in this District—the ryot may be able to purchase manure for his lands at much cheaper rates; he may be able to purchase seed and cattle; he may be able to dispose of his produce at a time when the prices are high instead of being obliged to dispose of them when the prices are low for the purpose of meeting the revenue demand of the Government. The ryot may obtain an advance from the Village Agricultural Association upon his grain for the purpose of

meeting various pressing demands, and await the rise of prices for the disposal of his produce. Then, again, he may take advantage of co-operation for other purposes than mere agriculture. If a number of ryots can combine together and purchase sugar mills, they may make sugar or jaggery, reduce the profits of the middlemen who intervene between the ryot and the consumer, and transfer the difference to their own pockets. Again, take the case of dry lands in this District. I believe what the dry parts of Madura suffer from is want of water. It is not that the soil is by itself poor, but it is the lack of water facilities that prevent many a part of these Districts from being properly irrigated or cultivated. If the ryots were to combine together for the purpose of buying oil engines and irrigating their lands by means of water drawn from wells by oil engines, there is no practical limit to the extension of cultivation and to the growth of more valuable products. Then, again, take the case of a ryot who owns a plantation of cocoanut trees. At present, he simply sells the cocoanuts. But if he can add coir making as a cottage industry, he can make a sensible addition to his earnings. A number of by-industries may be added to the occupation of the ryot, and he may earn a much larger amount of money than he has hitherto been able to earn by his customary occupation. As to the exact form which the Societies for these various purposes should take, whether they should be started with unlimited liability or with limited liability and share capital, all those are matters into which I do not desire to enter. They are matters which I have no doubt you will be able to solve with the help and the advice of the Registrar and of those gentlemen who have taken an interest in this movement and have studied the question closely. But at the same time, I tell you that these are the various directions in which co-operation may profitably be extended; and it is not a day too soon that the organisers of this Conference have thought of starting Co-operative Societies for the purpose of encouraging agriculture.

HOUSING ASSOCIATIONS.

Next to the subject of agricultural co-operation in importance is another subject in which I take a very great interest, that is, co-operation for the purpose of forming housing Associations. Those of you who have come from this city are aware of the pressure on the accommodation available and the need for the extension of the town. It is hardly necessary to dwell upon the importance of this form of co-operation. It is possible for a few well circumstanced individuals to build houses, model houses, it may be, in desirable localities, but for a large number of the poor class people some form of financial assistance is necessary before the problem of housing is satisfactorily solved; and I think that one of the most important objects to which co-operation could be applied would be the provision of better houses, which would bring fresh light, air and comfort into the dwellings of the poor. The problem of housing, in towns especially, is beset with enormous difficulties. It is impracticable for Municipal bodies to undertake the solution of this question, except it may be in the way of affording facilities for the acquisition of sites, for the laying out of sites and for certain other purposes for which it would be possible for them to provide out of the limited funds at their disposal. All further help for the purpose of attaining the object must, necessarily, come from the people themselves. It is only by co-operation that the amount of pecuniary help that is required can be obtained. It is very wise, therefore, that you have put this forward as one of the subjects which should engage the attention of this Conference. We have yet to learn the rudiments of sanitary house building and town-planning. Houses are generally allowed to be built in the most irregular and haphazard fashion without any regard for sanitary requirements or future extensions.

VILLAGE SANITATION.

Then again another matter to which Co operative Societies may turn their attention is the subject of village sanitation. Quite recently, I think, there was an Order passed by the

Government recommending this subject of village sanitation to the attention of the Co-operative Societies, especially in rural parts. I know no addition to the functions of these Co-operative Societies which would have a more useful and healthy effect upon the surroundings of villagers than the care of village sanitation. Ordinarily our villagers have no conception of what a well ordered and neat home is, and it would require a process of education to make them realise their advantages of good homes and surroundings and I think that Co-operative Societies may well take up this question of sanitation as a part of their work. All this addition to the functions of Co-operative Societies means education, and the education of the individuals who compose the Societies must be undertaken by the Central Bank or the Central Agricultural Association which may well take up this question of the education of the people in the rural parts as part of their working programme. They may undertake to educate the members of their constituent Societies in different villages, not merely in the management of Co-operative Societies, in the keeping of accounts, in the auditing of accounts, or in the exercise of scrutiny over transactions, but also in the management of various other forms of business that may be undertaken—in the management of village sanitation and in all the other directions in which it is intended to develop co-operation.

INSTRUCTION IN CO-OPERATION.

You ask in one of your draft Resolutions to increase the number of appointments of Agricultural Inspectors. You also require a number of itinerary Inspectors to go about in various villages and instruct people in various things which concern them as members in the co-operative movement. One thing, however, I may bring to your notice, and that is this. However useful it may be to have co-operation taught by the ordinary village schools, it cannot be so successfully taught as by persons actually engaged in the work of co-operation. It has been pointed out by Mr. Wolf that the best teachers of co-operation are those who were actually engaged in co-operation, and I should very much like to see co-operators going about the country to preach the gospel of co-operation, demonstrating its benefits in practical shape. I have read that in some parts of England and Wales there are demonstration trains run by some of these co-operators. They carry eggs produced by the co-operative system, stopping at the way side stations to demonstrate the practical benefits of co-operation. You want Missionaries in the cause of co-operation imbued with the same zeal and fervour as the Missionaries in the case of religion.

CORPORATE LIFE IN VILLAGES.

One result of the spread of this co-operative movement will be the revival of the corporate life of our villages, the extinction of which we all deplore. The village community was, at one time, a corporate body, but the days have gone by when it was a reality. But it is not one of those things of the past which we are willing to have buried and forgotten. Most of us are anxious to see the village community revived and brought into the full vigour of life. The Government are as much interested as the people in this revival. During the progress of the enquiry by the Forest Committee, we heard several suggestions to the effect that the village forests should be handed over to the Village Panchayats. But the spirit of corporate life has in many villages to be re-created. If the village community is ever to become a reality, I have no doubt it will be through the instrumentality of Co-operative Associations which are now springing up in different parts of the country.

AN EXAMPLE FROM IRELAND.

In spreading this co-operative movement, and in inducing our people to take up co-operation in various directions, you will, no doubt, find many occasions when you may feel depressed by the little headway that you are able to make and by the ignorance you have to overcome. I do no not think that these should make you pause on your path or induce you to turn back. I found a description

of the people of Ireland in Plunkett's book. He says that at the time when the co-operative movement was begun, the chief characteristics of the people were lack of initiative, independence, self-reliance and moral courage. I think that it applies pretty well to numbers of our own countrymen. Notwithstanding the above fact, the movement has succeeded wonderfully in that country, and it is merely due to the perseverance of the people and the wisdom of the leaders who guided the movement. One of our co-operative enthusiasts complained to me that the chief difficulty was the want of co-operative spirit and character. All these must necessarily be reckoned with by persons who will go forth as organisers of co-operation and will be successfully grappled with. You will be interested to learn that Plunkett had to address 50 meetings before he could organise a Society, and yet he was not discouraged. I have no doubt that those who are engaged in organising co-operation here will take heart from the example of Ireland, and will draw inspiring lessons from the records of achievements of co-operators in other countries.

THE WEAVER COMMUNITY.

There is one class of community among which, I am sorry to hear, co operation has not taken root. I refer to the weaver community. I should have thought that co-operation would have appealed to it, and that it would have started some Weavers Union, which would have enabled it to combine for the purpose of production and to put down sweating by capitalist employers. I do not bring any charge against the capitalists of Madura in particular. I do not know whether they do sweat or not. But if they are of the same type of human being as the capitalists in other parts, they are not likely to be free from the temptations of the class. The weavers should try to combine together and avail themselves of co-operation for the purpose of producing cloths which they can sell on advantageous terms to the dealers instead of disposing of them at the dictation of the dealers. I hope that this appeal will not fall on deaf ears. I hope that the co-operative movement will be taken to as earnestly and enthusiastically by that community as by other communities.

Credit Association for Small Holders.

The only credit associations which are supported by the Government of Denmark are the two so called "Small Holder's Credit Associations" founded according to the Bill of May 28th, 1880, the one for Jutland and the other for the Islands. The lowest loan given by the Credit Society of Jutland Country Real Estate Owners being 1,200 Kroner, and the one given by the Islands Association 600 Kroner, the small holders were unable to procure smaller loans and much dissatisfaction prevailed. As a result of this dissatisfaction, 5 regulations were passed, one of which was that loans can be issued from 100 Kroner to 3,600 Kroner, subject to the usual rate of interest and payment.

The credit Societies for Municipalities which was established by Bill passed in 1900 has also its peculiar characteristics. Before this association was founded, small municipalities had great difficulties in obtaining loans on reasonable conditions in spite of safe security.

Lastly, the Industrial Credit Society was founded in 1898 as a union with the object of rendering loans all over the country to owners of industrial estates and also to estates of similar classification, within a limit of one-half of the appraised value.

Besides the above mentioned societies there is the Credit Institution for House Owners in Copenhagen which—as distinct from above-mentioned societies, which are unions of borrowers—is a union of lenders, but which has working principles in the main as all the other societies. This institution reckons its coming into existence from a foundation charter as far back as the year 1797.

The Industrial World.

Supervisor of Scraps.

'WHEN a candle burns, nothing is lost' is an old truth which all of us have been taught while at school. Dirt or rubbish is simply useful matter in the wrong place, and the value of the expert lies in his finding uses for scrap materials. Thus one manufacturing plant has saved the salary of a man, and often has been helped to make a sharp turn in manufacturing, because of the appointment of an employee known as the "supervisor of scraps." The duty of this workman is to inspect all materials and small parts before they are consigned to the scrap. Small parts and castings which, it is figured, probably can be made use of in future are carefully noted, indexed and stored. In many cases it has been possible to use both castings and small parts—which, under the old system, would have been scrapped—in the construction of an old-style machine, unexpectedly ordered by an old customer.

Industrial Development of Mysore.

The Government of Mysore have long had under consideration the question of the creation of a department for dealing with matters relating to industries and commerce with a view to stimulate industrial activity in the State. The recent development of the work of the Economic Conference has emphasized the need for such a department. The Government have therefore been pleased to direct that a separate department of Industries and Commerce be constituted in the State and placed under a qualified officer, and that Mr. A. Chatterton, C.I.E., be appointed Director of Industries and Commerce and placed in charge of the department during his term of office in Mysore.

The principal functions of the Director of Industries and Commerce will be—

(1) assisting private individuals by advice, loans or in any other manner considered necessary to enable them to start industries and new business concerns, such as, the installation of mills, presses, irrigation and pumping plants, oil presses, rice hulling machinery, etc.

(2) furnishing, as far as possible, free of cost, estimates, schemes, prospectuses, articles of association, etc., to private captalists and also to bodies of persons, anxious to start joint-stock industrial or trade concerns.

(3) experimental installations in industries and manufactures at the cost of either Government or private individuals, such as, sugar-cane plants, lathes for wood turning, silk-reeling, etc., recently undertaken by Government.

(4) Development of trade and commerce—Under this head the following items may be mentioned :—collecting and maintaining correct statistics of industries and commerce for the whole State as well as for important trade centres, industrial survey, formation of a central industrial depot, a museum of industrial machinery and commercial products, and an information bureau, and study of markets for Mysore products.

The Durbar consider that the Director should devote special attention to stimulating private enterprise and private initiative in industries and commerce. It should be made known to the people that expert advice will be made available as far as possible free of cost. The Director is, therefore, requested to advertise the creation of the department and collect information as to the nature and extent of the facilities needed by private capitalists, land-owners and traders within the State

The Director has also been requested to submit for the approval of Government, a set of draft rules for regulating the grant of loans for industrial and commercial purposes. All loans exceeding Rs. 1,000 will receive the sanction of Government. Here is a lesson for other Native States in India to follow.

Washing Clothes by Electricity.

Considerable interest has been aroused among laundrymen in the last few months by a process of washing clothes by means of electricity, by which the time and soap necessary are greatly reduced. The National Laundry Machinery Company, Dayton, O., has recently issued patents on a greatly improved washing machine. It consists of an electro-equipped machine wherein clothes may be washed, bleached and disinfected by means of a current of electricity of any standard voltage. A terminal electrode is placed on the inner side of each end of the outer receptacle of the machine, and to these the service wires are attached. To each head and to all partitions of the inner revolving cylinder, known as the "wheel," a circular electrode is attached. This is made circular in order that some portion of it will at all times be immersed in the washing fluid. Each inner electrode consists of two flat rings one on each side of the partition or on each side of the cylinder head, bolted together, the bolts serving as electrical connections and as a means of holding the electrodes in position. These inner electrodes have no electrical connections other than the washing or electrolyzing fluid. Therefore, one ring of each electrode acts as a cathode and the other ring as an anode. Since on a cylinder of only one compartment there would be two pairs of inner electrodes, there would be three electro-chemical reactions taking place instead of only one reaction were the inner electrodes not used. If only two terminal electrodes were used, and at a voltage of 110 a current of two amperes were passed through, there would simply be the chemical reaction in the washing fluid caused by two amperes. But with the inner electrodes, at a voltage of 110 and two amperes there would be the same reaction in each compartment between each pair of electrodes. Therefore, the total amount of chemical reaction would be the equivalent of six amperes in one compartment, but with an expenditure of 220 watts as in the former case. This not only makes an economical arrangement, but a more efficient one regarding the results obtained through the gases liberated.

The Sugar Industry in the U.P.

At the annual meeting of the Upper India Chamber of Commerce, the Hon'ble Mr. H. Ledgard in his Presidential address referred to the sugar industry of the U.P. and said :—In these Provinces hitherto very little has been done towards the improvement of sugarcane. The cane farms were in the cotton-growing areas and there were few farms in the submontane or sugarcane tract. During the past year, however, two new farms have been started—one at Nawabganj in the Bareilly district and one near Shahjahanpur. The objects aimed at are the selection of the heaviest yielding indigenous canes with the highest sucrose content. The latter point requires examination by a chemist and the farm at Shahjahanpur is mainly devoted to a survey of the local canes from this point of view. In addition to this, the Government of India has brought out a sugar engineer to study the mechanical problem connected with sugar manufacture and to advise owners of factories. A grant in aid has been made by Government to the owner of a factory in Pilibhit to put in up to date machinery, on condition that the factory shall be used for the training of sugar engineers and sugar boilers. An advance has also been made for starting two factories in the Gorakhpur district. These of course are cane crushing factories. At present cane is in these provinces grown almost exclusively for making gur for eating purposes, owing to the decay of the indigenous sugar factories brought about by heavy importations of foreign sugar. This is not a healthy state of things as the demand for *gur* for this purpose is limited and a glut easily arises, as the result of a good season. It is believed there is ample room in the cane growing tracts for sugar factories which crush cane to turn out sugar at prices which can compete with Java.

The working of these assisted factories in the sugarcane belt is being closely watched by

Government, for the belief is entertained that not only is it feasible in India to successfully establish a system of central factories in the cane area which would crush the cane and immediately convert the juice into sugar without its passing through the intermediate and, as some believe, wasteful stage of *gur*, but that by this means chiefly, will the cultivator receive the necessary incentive to improve the quality of his cane, and continue or increase its cultivation. Given a ready market for his cane, spared the necessity of himself crushing it and converting it into *gur*, shown improved classes of cane and methods of cultivation there will be, it is asserted, no reason to fear the competition of Java or of German bounty fed sugar.

This is the ideal which the Government has so long had held up before it, and which it has so long refused to regard. Now that it has evidently appreciated the ideal, it remains to bring it to realisation.

Peanut Butter.

The Peanut, familiarly known in India as the Groundnut or Earthnut is a valuable economic product which has come to be grown very largely in South India. It is roasted and sold in the streets as an edible substance. It is largely exported from Madras and Pondicherry to Marseilles and other places in Europe where an oil is extracted which is largely used in the manufacture of soap, the residual cake being used as a valuable cattle-food or manure. It is a sad feature of this industry as of all oilseeds in India that the whole seed should be exported away to foreign countries thus depriving the country of a valuable manurial substance in the shape of the oil cake. It will be something of a compensation if at least better uses are made of the nuts instead of exporting them wholesale by using them in small industries which will add to the income of the small capitalists and provide work for the labourers in India. The manufacture and sale of Peanut butter is a growing industry in the United States and a circular issued by Mr. W. R. Beattie of the U.S. Department of agriculture gives valuable information on the subject, a summary of which appears in the January issue of the Bulletin of *Agricultural Intelligence.* It appears that in the United States several large factories and a number of smaller ones are now devoted to the manufacture of peanut butter with which to supply the rapidly increasing demand. Some of the larger factories are almost models in their construction, equipment and management while many of the smaller establishments which have no elaborate equipment, are turning out an excellent product.

Peanut butter consists merely of fresh roasted peanuts ground fine and salted. It is calculated that in 1911 about 1,000 railway cars of shelled peanuts, or 1,000,000 bushels, were used in the manufacture of this food.

In order to produce high class peanut butter the best of materials and the utmost cleanliness are necessary ; consequently it should never be prepared in premises attached or adjacent to a peanut cleaning establishment, on account of the dust.

In the United States, two distinct types of peanut are grown, the Virginia or Jumbo (including the varieties known as Virginia Bunch, Virginia Runner, and North Carolina or Wilmington) and the Spanish type (including the true Spanish, Georgia Red, Tennessee Red, and Valencia).

Three grades of shelled goods of both types are prepared. In each case No. I consists of whole kernels, No. 2 of split kernels and No. 3 of the finely broken and badly shrivelled ones. The use of the latter in the manufacture of the butter should be discontinued. The best grade of the Spanish and Valencia and the cheaper grades of the Virginia type of peanuts are commonly employed for the production of peanut butter. An admixture of the Spanish peanuts gives the product a greater degree of smoothness, but butter made from Spanish peanuts alone contains too much oil. Mr. Beatte suggests the possibility of using them after having extracted from them 8 to 10 per cent. of the oil by pressing. Peanut

butter of the proper consistency contains 41 or 42 per cent. of fat.

The successive manipulations that the peanuts are submitted to for the preparation of the butter are the following :

1. Roasting at about 160° C. for 30 to 35 minutes.

2. Rapid cooling by a cold air blast.

3. Blanching, that is, removal of the outer red skins and the germs. This is accomplished by means of blanching machines consisting of a set of brushes revolving against a corrugated plate.

4. Hand picking for the removal of small pebbles, discoloured or inferior nuts, etc.

5. Blending of the different kinds of peanuts used.

6. Salting with 1½ to 3 per cent. in weight of salt.

7. Grinding to a fine granular form.

8. Bottling and packing.

Mr. Beattie describes with full particulars each of the above operations as well as the necessary plant, and gives illustrations of some of the model factories.

Match Industry in India.

A very interesting and highly instructive lecture was delivered recently by Prof. N. N. Godbole, M.A., B. SC. of the Dyal Singh College, Lahore, on the subject of the " Match industry in India." Mr. Godbole has studied the subject not only theoretically but would also seem to have got practical experience in match making learnt in a factory of his friend at Dharwar.

The lecturer said that match was an article of daily use and the total consumption of the whole world amounted to 2,000 millions per day. India used about one match per head per day while Europe consumed 4 or 5 per head, due perhaps to the greater habit of cigarette smoking. The lecturer divided the subject into 4 parts, namely (1) the production of the commodity,(2) India as a match making country (3) deta ils and (4)chances of success for India. Taking production first, he said there were four elements that were necessary to the production of a commodity. These were (1) land or as he preferred to call it, matter, (2) labour, (3) capital and (4) idea.

As for Matter, he said there was plenty of wood in India and it was rotting and being wasted. The Himalayas, for instance, were an inexhaustible source of wood supply but there were jungles of pine, poplar, willow and other kinds of trees also in Burma, Poona, Western Ghats, Travancore and other places. The matches manufactured out of the wood of these trees were found to be better than the imported ones but the industry had little chance of success in the Southern part of India owing to the good quality of wood being out of its reach. This is ominous warning for the shareholders in the projected match factory in Travancore which however would to be floated under favorable auspices.

As regards Capital, the lecturer said, though India could not compare with the capitalists of foreign countries where one Rothschild could purchase the whole of London, if he so desired, there was no dearth of them here. There was plenty of money but the regret was that it was in ignorant hands. He cited the instance of a director of a joint stock factory in Baroda who was so ignorant that he believed the mill was not working when he found no smoke arising from the chimney. It was only when the engineer in charge put double the amount of coal needed for the working out of the engine and there was great smoke at the chimney, that the man knew that the mill was actually working. Education was, therefore, necessary for the proper guidance of capital.

The labour in India was not only to be had in plenty but was much cheaper than in other countries. The only defect was that it was not properly used and that defect could easily be removed by educating labour. Labour, however, was of two kinds—chemical labour and expert labour. Indians on return from foreign countries showed utter lack of expert knowledge and did not study the special conditions and climate of their country while abroad. Some of them had failed to solve the 'great problem' of the composition of damp proof matches.

The fourth element of production was 'Idea.' Things are sold because people buy them, and they were made of a certain order because people wanted them to be so made. Anything that could not be sold in England, found an easy market in India. This was due to the low state of our 'ideas' and tastes which required to be developed.

India afforded great prospects for the development of the industry as was shown by the following figures. She imported 491,789,000 lb. of matches from foreign countries in 1907-08; 496,671,000 lb. in 1908-1909; 543,684 lb. in 1909-10; 551,411,000 lb. in 1910-11 and 583,884,000 lb. in 1911-12. In the above figures, India included Burma.

Besides such a great demand for the commodity that existed here, India possessed numerous advantages which were denied to any other country. Her plentiful supply of wood, cheap labour, and water transport were a few of them. Of course, there were certain disadvantages as well, for instance, scattered wood trees, backward communication, and the cost of importing phosphorus and other requisites, but these were obstacles which could easily be surmounted. He only wanted the Government to plant trees, grant railway concessions and encourage primary education. From the public he wanted mere sympathy, patriotic love, and as he humourously remarked, he wanted them to love country-made things, in spite of their roughness, just as they loved their wives.

Industry in Japan.

At a Meeting of the Japan Society, held in London on the 8th January last, Mr. A. Aoki, Vice-Consul of Japan, read a paper on "The Modern Industries of Japan."

Mr. Aoki, in introducing the subject, said that the modern industries of the country began with the Restoration brought about 45 years ago, which marked the turning point of the nation. Previous to that, industries were carried on under very irritating conditions by the common people, who ranked as inferior to the ruling classes. Under the new *regime* these restrictions were abolished and complete industrial freedom was established, the masses having the liberty to pursue any trade or profession according to their inclinations. The traditional contempt of being engaged in trade also disappeared, and some of the best families in the country did not scorn to become traders, and to-day many great industrial concerns were carried on by men who were not considered one whit inferior in rank to the ruling classes. The best measure of industrial progress was that of the foreign trade. Thirty years ago, the total value of the exports and imports was only £6 million, or about 3*s*. 6*d*. per head of the population. In 1911, it amounted to no less than 96 millions, or £2 per head, some sixteen times as great. Thus within little more than a quarter of a century, Japan had gained a place in the forefront of oriental nations. What, Mr. Aoki asked, were the causes of this remarkable development? First among them was the exceedingly opportune measures adopted by the Government for the guidance and protection of the nation's industries. The second was the indomitable energy with which the people succeeded in blending into one harmonious whole the arts and manufactures of the East and the West.

The annual value of the produce of the agricultural classes amounted to £150,000,000. They supplied the Empire with food and drink and the greater part of the raw material for manufacture. If the best scientific methods were applied to the present farms and to the reclaimed lands, it would not be vain to expect the value of the staple agricultural products to be doubled in the near future. Alluding to fisheries, Mr. Aoki said that at present $1\frac{3}{4}$ millions of the people are engaged in them, the annual value of their catches amounting to £10 millions. With regard to forestry, he mentioned that one-fourth of the area of Japan is covered with forests producing wealth in various forms of the annual value of £13 millions.

Although Japan was not as rich in mineral resources as in agriculture and fisheries, she

had more deposits than she herself required. The total value of her mineral wealth now reached 11 millions per annum. Every year she exported copper, coal, sulphur, antimony, and manganese to the value of $4\frac{1}{2}$ millions, and imported $8\frac{1}{2}$ millions' worth of iron, lead, tin, zinc, mercury, petroleum, etc. Within the past 45 years, modern methods had been introduced, and mining industries had entered upon an entirely new life. There seemed, however, to be much room for technical and engineering improvement in many mines.

The recent progress of the manufacturing industry in Japan was remarkable. Within the last ten years the number of factories and operatives had nearly doubled. About 800,000 hands were now employed in 14,000 factories, leaving household industries out of the question. The textile industry stood at the head, silk and cotton manufacture being the most important, and, as a whole, the future of this industry was very hopeful, while machine and iron manufacture had also made great progress.

In 1911 the exports of food and drink exceeded the imports by £100,000. Manufactured articles exceeded the imports by more than £1,000,000, and raw material fell short of the imports by £8,000,000. All this plainly showed that Japan was becoming more and more a country exporting goods manufactured from imported raw materials. Conflicts between capital and labour as known in Europe and America were unknown in Japan.

In conclusion, Mr. Aoki remarked that Japan would not be slow to see and to remedy any defects in her industries, and with the foresight and energy she had shown in the past she hoped to make steady progress in the future.

Industrial India.

Sir Guilford Molesworth lecturing recently before the East India Association, said:—In a paper submitted by me to the Indian Industrial Conference of 1906, I urged that, amongst other means of developing the industries and the vast potential wealth of India, It was necessary—"To govern India, not on English grounds by people in England, but by the Government of India in the interests of India alone; and to resist the interference of the Home Government in any attempt to sacrifice Indian interests to the exigencies of English Party politics." At the second Industrial Conference of 1907 I submitted the following resolution :—

'Resolved that this conference urges on the Government of India—(1) To inaugurate a carefully considered policy of moderate import duties, which will not only yield a revenue that will relieve the land from the dead weight of taxation, but will also protect the industries of India from unfair and unrestricted foreign importation. (2) To foster International and Inter-colonial trade by the exchange of mutual concessions and preferential treatment with the Colonies and with Great Britain.' Few, I think, will dispute the axiom that our rule in India is a sacred trust into which we have drifted from force of circumstances, and that its Government should be strictly in the interests of India; but I would go farther than this in asserting that a selfish policy of rule in the interests of England is a foolish policy, because the prosperity of India means the prosperity of England In 1899, at the request of Lord Elgin, the Liberal Viceroy, the British Government joined the Brussels Sugar Convention, and, despite the prophecies of the opponents of that measure, the price of sugar did not rise; on the contrary the average price of beet sugar for the first five years, 1904-1908 inclusive, was lower than the average for the ten preceding years under the bounty system. And it was only in consequence of unprecedented failures of crops in 1909, 1910 and 1911, that the price has risen. But even including these three years of failure, the average rise of price during the eight years under the Convention only amounts to one-twentieth of a penny per pound of sugar. In August last, however, the Prime Minister withdrew from the Convention, for no reason that can be discovered except that it was an electioneering sop on the eve of a bye-election to conciliate the cocoa press and the jam and confectionery interests. There had been no

previous debate on the subject in Parliament, and it was by the arbitrary action of Mr. Asquith that this deadly blow has been struck at India's industries. Well may we parody Lord Byron's description of the dying Gladiator, 'Butcher'd to make a Roman holiday,' for India has been 'Butcher'd to keep a British Cabinet in power. Nor are sugar and cotton the only industries penalised. An excise on Indian tobacco has been imposed to conciliate the cigarette-making constituency of Bristol, and on jute to conciliate Dundee; but in the latter measure the mark has been overshot, and has inflicted injury on the jute industry of Dundee. It is not in fiscal questions alone that the mischievous interference of the Home Government has been felt. I speak from bitter personal experience with regard to the railway department with which I was connected. With every change of Ministry, or Viceroy, under political party influence, questions of management, control, gauge, and policy have been re-opened, causing want of continuity, confusion, and enormous waste of money. During the first ten years of my tenure in office there were five radical changes in control and management. Railways were constructed on one gauge and afterwards altered to another. The Punjab Northern Railway was commenced on the standard gauge, then nearly finished on the metre gauge, and finally completed on the standard gauge. In 1881 political pressure was put upon Lord Hartington, to the advantage of 'private enterprise,' to conciliate English speculators, and Lord Ripon came out with orders to reverse the able railway policy of Lord Lawrence, which had been eminently successful. This change was forced on the Government of India notwithstanding the strongest protest of the Secretariat officials. In a minute to the Government of India, I protested that the Home Government was showing a want of patience that resembled the policy of children digging up seeds to ascertain whether they were growing. The Accountant-General, in a powerful note, showed that Lord Lawrence's railway policy had been successful beyond all expectation; that in no respect was greater efficiency insured by a board in London than under Government control; that, under the proposed reversal of policy, the State was to part with its profitable lines to private speculators when they had begun to show a profit, keeping its unprofitable railways in its own hands while carefully guaranteeing the speculators, however, at the expense of the State, from any possible loss, whether due to their negligence or not. He further pointed out that the proposed concessions to one railway alone were equivalent to a gift of at least half a million sterling, taken from the pockets of the Indian rate-payer, and sent out of the country. But all protest was in vain. Lord Ripon had his orders, and, after reading these protests, he simply minuted upon them:—'This may be allowed to drop quietly.—R.'

And the once-flourishing native industries have been crushed out by unrestricted foreign competition. Old slagheaps may be found throughout India testifying to the former prosperity of such industries; the splendid native iron and steel have been superseded by inferior material of foreign manufacture. India has every requisite for manufacturing and producing most things at a very low cost, and there is no reason why she should not supply the Mother Country and the Colonies with those articles which they do not produce; but no attempt has been made to foster International or Inter-colonial trade by the Exchange of concessions which would be mutually advantageous. The coal-fields, so far as they have been explored, cover an area of 35,000 square miles, and are estimated to contain 20,000,000,000 tons of coal. In Bengal and Assam there is coal nearly equal in evaporative power to medium Welsh steam coal, though inferior to Aberdare. In some parts of India the supply of iron ore is on a scale of unparalleled magnitude, whole hills and ranges of it being of the purest varieties. There are also available in India millions of potential horse-power in the form of water flowing from the mountain ranges, capable of being converted into electrical energy at generating

stations near the hills, and conveyed with slight loss to centres even at very greatdistances, where it can be utilised for industrial purposes. With regard to sugar, Dr. Royle has stated that India could produce enough cane to swamp the world's market. The present yield of wheat in India is about 44,000,000 quarters, or about 17,000,000 quarters in excess of the total imports of wheat and wheat flour into Great Britain. In the Punjab alone, there is cultivable waste sufficient to produce 16,000,000 quarters, besides enormous tracts in Burma and other parts of India only requiring irrigation and population to bring them under the plough. If India had, by preferential treatment with regard to foreign wheat, the inducement of a steady and certain market to grow Indian wheat, there can be no doubt that the cheap labour and low railway rates prevailing in India could enable her to supply England with all the wheat she requires at rates lower than those at which foreign nations now supply her. India was originally the parent of the cotton industry. The very name 'calico' is derived from Calicut, the place from which the famous longcloth originally came. India can grow cotton in such abundance that in 1909-10 she exported it in its raw state to the value of £20, 850,000 ; yet during that period, manufactured cotton goods were imported into India amounting in value to more than £24,000,000. India formerly produced excellent cotton, but it has degenerated and is short in staple. The Inspector-General of Agriculture declares that our knowledge of indigenous cotton is incomplete, and its degeneration is not due to inferior cultivation or to exhausted soil. The black cotton soil is very fertile, and he attributes the deterioration to the continuous use of unselected seed. Others say the short staple is due to a great extent to careless and improper cropping. Be this as it may, there can be little doubt that if the cotton-growing industry had been fostered, the quality would have improved and the quantity increased, and Lancashire would not now have been dependent on the speculation of the American Cotton Rings for its supply. Again, with regard to the demand for iron and steel. The London and North-Western Railway with its few hundred miles of line is able to manufacture its own steel rails, chairs, and other permanent-way materials, as well as its bridges, locomotives, and rolling stock. Surely India, with its 32,000 miles of railways, ought to afford a demand sufficient to justify the manufacture of some of these in the country. It is now the accepted policy of the State to render India practically independent of external supplies as regards her Army, by establishing Government factories in various parts of the country for the manufacture of arms, ammunition, clothing, equipment, and munitions of war. There is no reason why this policy should not be extended to her State railways and other public works, and to the needs of the country in general. A broad-minded policy on these lines would open up the great but undeveloped wealth of India. I cannot agree with those who argue that there is no market for the produce of Indian industry. As regards internal consumption, statistics of our imports show that there is a large and increasing demand, and the very development of industries would increase that demand. Sugar, for instance, is one article, which India is in a position to supply as cheaply as any country in the world, yet in 1909-10, sugar, probably bounty-fed, to the value of £7,680,000 has been imported into India. Of late years there has been a considerable increase in Indian industries, especially in jute and cotton, but it has been uphill work ; and there has also been very material progress in trade and commerce ; but true development of the latent wealth and resources of India falls very far short of the magnificent potentialities of the Empire, and is not at all commensurate with the progress which ought to have followed the great extension of railways and irrigation work, which have proved so beneficial to India. 'England, with its dependencies, if properly governed, might be independant of foreign nations for its trade, commerce, markets and production. . . .The only true and statesmanlike policy lies in governing the Empire and its dependencies as one vast country, the interests of any one portion of which should be considered inseparable from those of the whole protecting jealously every industry ; seeking every possible means of employing the labour and developing the resources of all ; fostering every industry, when it needs fostering, and releasing the fostering care as soon as such care is seen to be unnecessary ; protecting only to the extent that may be needed to prevent the decay of an existing industry, or to enable a new industry to spring up ; the primary aim being to utilise the labour and produce of the whole, and to ensure a market for the produce in our own great UnitedEmpire.

The Commercial World.

Commercial Enterprise in India.

THE commercial enterprise in the month of December 1912 is shown by the following abstract of companies registered in that month :—

		Rs.
6	Banking and Loan Companies ...	25,00,000
5	Insurance Companies ...	2,90,000
3	Printing, Publishing and Stationery Company ..	1,39,500
10	Trading Companies (other than specified above) ...	17,10,000
1	Jute Mills Company ...	12,00,000
1	Rice Mills Company ...	30,000
1	Mills and Presses Co. (other than specified above) ...	2,50,000
3	Tea and other Planting Companies ...	7,00,700
2	Coal Mining Companies .	3,85,000
1	Mining and Quarrying Company(other than specified above)	1,50,000
1	Sugar Manufacturing Company...	10,00,000
1	Company other than specified above. ...	1,00,000
35	Grand Total ...	84,55,200

Sugar Imports.

India, the largest sugar growing and also sugar importing country in the whole world will have, observes the *Pioneer*, fewer orders to place abroad this year for the very satisfactory reason that her own yield is expected to be the highest on record. The final estimate is for an outturn of 2·5 million tons of unrefined sugar or an increase of 100,900 tons as compared with last year and one of 422,000 tons or nearly twenty per cent. as compared with the average of the preceding five years. This result seems to show that the efforts of the various Agricultural Departments in the past few years to encourage the growth of a better class of cane, more scientific cultivation and less wasteful methods of manufacture have not been in vain, even though the day when India will be able to supply all her own wants and be a large exporter of cane sugar besides is yet some way off.

A New Line of Steamers.

It is now settled, writes the *Pioneer*, that we are to have a new line of steamers from Europe to Bombay, Colombo, Madras, Calcutta and Rangoon. This new line is being inaugurated by Mr. Dan Brostrom, a well known Gothenburg shipowner and director of the Swedish East Asiatic Company, Ltd. This move has been brought about because it has been found in practice that Swedish factories lose considerable orders on account of their inability to compete with countries having direct communication with India. A Swedish line already runs to the Far East, but these steamers already receive all the cargo they can carry ; hence the necessity for a special line. The new line of steamers will load at one or two ports in Northern Sweden and will finish taking in cargo at Gothenburg and Christiana (Norway). It is felt that there will not be much difficulty in obtaining return cargoes—rice from Rangoon, tea and jute from Calcutta, cereals from Bombay, and so forth. The passenger question does not seem to have been finally settled but stands in no danger of being overlooked. Agencies are now being arranged at the principal Indian ports to represent the new shipping venture. If it decides to hold aloof from the Liners' Conference, which is really a shipping combine whose object is to fix both freight and passenger rates against the public, it should play an important part in the Indian shipping world.

Hooking the Buyer.

The American Manufacturers' Export Association has recently inaugurated a buyer's bureau of information. The plan includes the appointment of special agents in the principal cities of Europe, the Orient and Central and South America, who will advise the secretary of the association of the intended

sailing of the merchants or buyers, so that they may be properly received in the States, and put into immediate touch with those American manufacturing exporters who manufacture the classes of articles wanted.

The Adulteration of Jams.

Mr. Ernest Marriage read a paper on February 19 before the Royal Society of Arts on "The Adulteration of Jams." Mr. Marriage said that the general form of adulteration was to "improve" jams derived from dearer fruits by the addition of pulp or juice from cheaper fruits. The mainstay of adulteration was the apple, while lemons, gooseberries, and even red currants were pressed into the service. Rhubarb, too, was employed. A study of manufacturers' labels showed how widespread the practice was, when reference was made to the "addition of other choice fruits" or to the "addition of fruit juices," the object being to evade the provisions of the Food and Drugs Acts. The Acts became a farce if attention was not paid to the words "and not intended fraudulently to increase its bulk, weight, or measure," and, unfortunately, magistrates were apt to ignore them and to accept the defence that the labels on the jams admitted "improvement" with other fruits. When fines were imposed they were not adequate, and it was therefore desirable that the manufacturers should also be made liable. Another attempt to evade the Act was to leave out the word "jam." "Improved" jam in every case cost less to make than pure jam. The dodges tried by defendants when they got into the Law Courts were amusing; one defendant or his representative suggested recently that it was as reasonable to expect apricots in apricot jam as sunlight in Sunlight Soap. It was curious to notice how much plum jam required "improving" when the plum crop was a light one.

A Hint to Manufacturers.

It is well known that it is a herculean task to divert established trade. That is why manufacturers always try to be first in new markets. The attention of British manufacturers is called in the *Board of Trade Journal* to the desirability of making arrangements in advance of the opening of the Panama Canal for taking advantage of such increased trading opportunities as the new route may offer. The *Journal* states that information has been received by the Board of Trade from a trustworthy source to the effect that certain foreign manufacturers are carrying out an organized campaign in South America especially in those countries which will be brought into closer contact with the principal manufacturing countries by the opening of the canal—*viz.*, Bolivia, Peru, Ecuador, and Colombia—with a view to capturing the local markets at the earliest possible opportunity. As an instance, it is said that one important firm of Continental manufacturers have despatched a commissioner on their own account to investigate and report to them in detail on the prospects and development of the countries named, and the probable requirements of settlers and natives, so that they may be able to make arrangements for securing the market for their goods. Foreign companies interested in the metallurgical possibilities of the countries referred to are also said to have a number of men already on the spot with the object of securing the most promising mining claims in anticipation of the time when the shipment of ores may become commercially practicable.

Do Advertisements Pay?

Whatever advertising ought to do in the way of "bring your name before the public," "making a valuable goodwill," etc., there is one thing it ought always to do, and that is to pay for itself immediately and ultimately to show a profit.

There is an old and somewhat grim story of a triumph in surgery where a most brilliant surgeon performed a feat of skill as to which, however the subsequent report was "operation successful—patient dead." So, however pretty, or startling, or amusing, or astounding a sales-making scheme may have been, it has failed to justify itself if it has

not left the business more prosperous and with additional vitality. Therefore, the first question for the advertiser, new or old, to consider, whenever a scheme of advertising is submitted to him is "Will it pay?" No advertiser is on the right lines unless he is aiming at that definite result, neither "showiness," nor "sensation," but just the one plain and simple effect of making the advertising pay.

The man who has to pay for the advertising may have very clear ideas as to what he wants put into his advertisements; and yet his ideas may be altogether wrong. Again, he may have exactly the right idea; and even then he may lack that expert knowledge which alone can direct him as to how best to put his ideas into shape and guide him as to where they are to be placed to do him the maximum of good. His right ideas may be wrongly presented, or they may be placed before the wrong class of people. But whenever the two intelligences co-operate—that of the commercial man in manufacturing the commodity and that of the advertising man in presenting and placing the appeal for business before the public—there ought not to be much doubt about the result.

The Carriage of Fruit.

In a country like India where fruit is so much appreciated and grows in such variety and abundance, it would appear, says *Indian Engineering*, to be almost self-evident that trade would be stimulated if fruit, and probably a few other necessaries, received the same treatment for transport as is received by them in other countries where the heat is much less and consequently pre-cooling and cooled carriage are less imperative. The necessity is not felt in England; but in America, with its long lines of transportation, it is felt and most scientifically met. There the railways establish the plant and drive a good business by its means, combining with the pre-cooling plant, plant also for ice-making. On the Atchison, Topeka, and Santa Fe' Railway, plant has been established at San Bernardino, California, in the centre of the citrus-growing district, the method being for trains to pick up fruit and run into the factory, undergo the process there, which occupies four hours, and then run on to destination. The plant is of enormous capacity, being capable of dealing at one time with 32 railway cars, 16 on each side of the icing dock, and as each operation takes four hours, its full capacity is about 150 cars per day. After pre-cooling, the cars are supplied with ice and sent on their way, and are replenished with ice at intervals, *en route*. Ordinary cold storage conditions require 24 hours to bring the freight down to the safe carrying temperature of 45°F. as against 4 hours by the pre-cooling process, this including the time occupied in connecting up the two lines of cars each to the 22-inch air ducts, and establishing complete circulation. It is found, in fact, that by the method of pre-cooling the whole expense comes to less than the cost of handling along under storage conditions. The difficulty of transporting fruit from place to place in India itself is notorious, leave alone transport in the country, on account of the great heat. Our finest fruits grow in the hottest months, but let any one attempt to send a consignment of, say, mangoes from Bengal to the Punjab and note the result. In Coorg oranges as fine as may be obtained in any part of the world grow to profusion and at times may be had for the asking, at a season too, *viz.* April, when they would be highly appreciated in the plains of India. But for lack of preservatio facilities, they are more or less a waste product. It may also be asked how much of the splendid melons, peaches, grapes, etc., that grow in our Frontier Province is ever seen on this side of India, and why? It is the belief of our contemporary that if refrigeration and cold carriage were established in the country there would be a large opening for fruit farming in the country with the probability of export to Europe.

Railway Receipt as a Document of Title.

S. Amarchand *v.* Ramdas and Chhaganlal *v.* Ramdas are two appeal cases of interest to the mercantile community which have recently been decided in the High Court of Bombay

before the Chief Justice and Mr. Justice Chandavarkar, Judgment in both these appeals was delivered together.

In both the appeals, the appellant was an endorsee of a railway receipt from the firm of Chhaganlal Kalidas, who purchased the cotton bales mentioned in the receipts from Ramdas Vithaldas of Bagalkote. Ramdas had,as unpaid vendor, stopped the cotton in the hands of the B. S. N. Company whilst in transit.

In the course of his judgment, the Chief Justice said that the railway receipt in the case was a document under which the goods were received for a mixed transit by land and sea. And, though Mr. Justice Macleod had said that a railway receipt could not become a bill of lading, yet, according to section 103 of the Contract Act, it was not only a bill of lading but any other instrument of title to goods which might be assigned with the same effect as resulted from the assignment of a bill of lading. And for that reason and on the especial facts of these cases, the railway receipt, if assignable by endorsement, would be an instrument of title to goods under section 103 of the Contract Act. In G. I. P. Railway *v.* Hanmandas, no doubt,it was held that a railway receipt was not an instrument of title under section 103 ; but that was a case of conveyance by land and in that respect the element of voyage by sea under a combined receipt and contract issued by the carrier was absent. Also, since that case, the chapter of the Transfer of Property Act, relating to the assignment of contractual claims, had been made applicable to the Bombay Presidency. And the Transfer of Property Act contained an express statement that railway receipts should be included in the expression "mercantile document of title," authorising either by endorsement or by delivery the possessor of the document to transfer or receive the goods thereby represented. Section 137 of the Transfer of Property Act put an end to the question. His Lordship was of opinion that the appellants in each of the appeals were entitled to the benefit of section 103 of the Contract Act against the unpaid vendor.

As to the custom of the trade relating to railway receipts, His Lordship said that the result of the railway receipt being an instrument of title as against the unpaid vendor, did not depend upon custom, but was a matter of law which was stated in the section. He was of opinion that for those reasons the judgment of the lower court should be reversed in both cases. In each case the unsuccessful respondent was to pay the costs and in each case the person, in whose hands the sale proceeds were, was to hand over the net sale proceeds to the successful appellants.

Uniform Weights and Measures.

In an article on the above subject in the January number of the *Empire Review*, Mr. Hardwick traces the history of the movement for decimalisation of weights and measures from the year 1849 down to the present day. He deplores the existing incongruous collection of irregular and discordant denominations, which have been allowed to accumulate, regardless of system or method. He then deals with the opposition to the introduction of a more National system. Says the writer :—"Our opponents say that halving is easier than decimal subdivision; that the number twelve has more divisors than ten, and therefore lends itself better to subdivision ; and that there is no recognised measurement in the metric system between the millimetre $\frac{1}{1000}$ metre, and the micron, $\frac{1}{1000}$ millimetre. They refer to twelve as if we possessed an all-twelve system, but we do not. Neither the weights and measures nor the coinage are duodecimal in arrangement, or systematised to any particular number." In order to obtain the full benefit to be derived from decimalisation, both systems—weights and measures and coinage—must be in a condition to work concurrently in decimal harmony.

The relationship between the penny, shilling and dozen works conveniently, by which we are able to calculate more rapidly than usual the price of one article at, say, 36*s.* a dozen, as 36*d.*; but there the advantage ends. But, to discover the price per gross, per hundred, or per thousand, requires an arithmetical

calculation. And the same advantage that accompanies twelve exists with the number ten, and to an unlimited extent. By the all-ten or decimal system—taking the florin as the unit—36*s*. a dozen, which is equivalent to fl.15·00 per ten, shows at once: 1·50 for one, 150·00 per hundred, and 1500·00 per thousand —discovered without any calculation whatever, by the mere movement of the decimal point. By the same easy method, the merchant and the tradesman would be able to compute their prices. Lastly, as regards the subdivision of the millimetre. What justification is there, says Mr. Hardwicke, for the objection to the use of the centimetre? It is as easy to work to fractions of that measure as to work to fractions of an inch. It thus becomes a matter solely of providing new machinery for tool makers and altering the Standard Wire gauges. The at-present undenominated decimal subdivisions will have to be designated. Another subdivision to be called "*Mechanic Measure*" will have to be added. The writer then gives a table of the metric weights and measures, based on the foregoing suggestions and continues,

"The act legalising the use of metric weights, though it came into force in 1897 has not yet found universal adoption. Universality and exclusiveness will not take place until it is made compulsory. And this end should be attained simultaneously with the decimalisation of the currency."

The immediate effects of this change would be :—

Articles now sold at per dozen and per gross would be sold at per ten and per hundred. As regards distance, mileage would become "kilomage," and milestones and posts "kilostones" and "kiloposts," and kilomage would have to be taken approximately in connection with legal distances. In international commerce, the British merchant can with very little trouble convert present money into decimals by using the florin as the unit, treating it as consisting of 100 fractions or "centese," and reckoning every 1*s*. and 6*d*. as 50 and 25 centese (*i.e.* as $\frac{1}{2}$ and $\frac{1}{4}$ fl.) and the odd pence as 4c. to the penny.

On these criteria, the writer suggests 9 clauses for embodiment in an amending "*Weights and Measures Act*" and concludes. "That some inconvenience would be felt during the period of change may be expected, but it would be very slight and of short duration. Moreover, when the benefits that would accrue to a great commercial nation such as ours are taken into consideration, a little personal inconvenience might, I think, be borne ungrudgingly."

Congestion on Railways

Readers of newspapers in India have doubtless noticed the agitation of the Anglo-Indian Press, Platform and Mercantile bodies for the investment of more and more money for opening more new Railway lines in India. The cry has received some ostensible support from the fact that Indian Railways have been unable recently to cope with an enormous traffic which has some what unexpectedly developed in the country. The complaint in one quarter is that more wagons are wanted. Thus the Hon'ble Mr. A. M Monteath in his annual address to the Bengal Chamber of Commerce observed :—I do not think you will gainsay me when I describe Wagon Shortage as the burning question of the past few months. We have all suffered from it in a greater or lesser degree, we have all had difficulty in getting the products we are interested in, transported from one point to another, and this scarcity of transport has resulted in many cases in definite loss and in others in curtailment of trade and notably in the coal trade has driven trade from India to foreign countries. The Chamber's agitation in the matter, the consequent Railway Traffic Conference and its report, are all fresh in your memory, and I need not refer to the details here, beyond stating that I believe Government are now alive to the importance of the issues at stake and are doing what they can to rectify it by alloting 12 millions sterling this year for the extension and expansion of Railways. As to who is to blame, whether the Railways, the Railway Board, the Commerce Department or the Finance Minister,

I do not know, but I should not be surprised if it was the last named gentleman, for the root of the trouble is money.

The complaint on the Bombay side seems to be, according to the Hon'ble Sir C. H. Armstrong "not so much shortage of wagons and rolling stock as need of larger station yards, more sidings and crossings and doubling of lines in various directions."

The Hon'ble Mr. Ledgard however speaking before the Upper India Chamber of Commerce stated that the defect lay in the inadequacy of haulage power.

There is no doubt of the inability of the Railways to cope with the development of the traffic but that has occurred somewhat unexpectedly and be it noted not only in India but elsewhere also in England, France, Germany, United States.

In the discussions on the Financial statement, the Hon'ble Mr. Clark, Member for Commerce and Industry, explained the reasons for the congestion admirably. He said :—

I think it is desirable that I should say a few words on the subject which has been of capital interest in the last 18 months—the question of congestion. It is a problem of far-reaching importance, affecting alike the commercial, industrial and agricultural interests of the country ; and it is only right that the Council should have Government's policy in the matter put clearly before them. First of all, as to the nature of the task which has upset the railways. There has been an enormous and altogether unprecedented expansion of trade in the last two years. Our total import and export trade in the calendar year 1912 showed an increase of £25½ millions over 1911 and of £42½ millions over 1910. Some of this increase must be put down to the rise in prices, but with all deductions made, the figures are still enormous. The statistics of shipping tell a very similar tale. So great was the activity in foreign commerce that the total tonnage entered and cleared at Indian ports last year was more than a million tons in excess of the figures for 1911. The increases in exports of agricultural produce especially, have been phenomenal. Shipments of grains of different kinds increased in the last 2 years by 48 million cwts. Barley alone, which in 1910 was exported in only a trifling quantity, amounted last year to 13½ million cwts. And it is not too much to say that when foreign trade has been so markedly prosperous, the internal trade of the country for which correspondingly recent figures are not yet available, will not have lagged far behind.

Now these figures indicate two things. They indicate the great strain which has been put on the railways and they also indicate that they have by no means broken down under it. I have no desire to minimise the serious losses caused to producers and manufacturers by the delays to traffic and by the undoubted failure of the railways to carry all that has been offered; but they are entitled to this much credit:—for, if their failure had been anything like as complete as it has been represented in some quarters, this huge expansion of the country's trade could scarcely have taken place. Efficiency of railway transport is an essentail factor of commercial expansion in any country. But especially so in a countrv of vast size like India, where a year of exceptionally good trade implies the movement of largely enhanced volumes of agricultural produce. In point of fact the carrying capacity of the railways has shown itself remarkably elastic. The actual weight of goods carried in 1912 reached the record figure of 84 million tons—13 million tons more than in 1911 and 19 millions more than in 1910. This, I venture to think, is no mean achievement.

WORLD WIDE PROSPERITY.

The prosperity of the last two years has not been peculiar to India ; it has been world-wide. Similarly the strain on railways would seem to have been a very general experience in the great commercial countries of the world. Students of the railway papers will have noticed that the same complaints have been heard in France, Germany, the United Kingdom, Canada, and the United States of America. A great railway expert in the United States recently spoke of the disaster, I use his own word, with which the commerce of the country was threatened by the deficiencies of the railways. I do not mention these examples as in any way desiring to whittle away Government's responsibility for the losses and difficulties which the defects of the railways have caused in India, any more than the responsibilities of railway administration in the United States could be lessened by American railway magnates citing the troubles of Indian railways. But it is a significant fact that the same phenomena should be producing themselves simultaneously in countries like India, France, and Germany, where Govern-

ment takes a hand in the administration and management of the railways, and in those such as England and the United States, where railway management is altogether a matter of private enterprise. I think the fact illustrates the true nature of the difficulty—the difficulty, namely, that railway facilities cannot beyond a certain point be rapidly expanded to meet a sudden and violent increase in demand. It will be said, no doubt, that Indian railways even in altogether normal years are not equal to the demands made upon them. That is not an entirely fair way of putting the case, for the difficulties of Indian railway administration are enormously complicated by the seasonal nature of Indian business, which means great pressure for a relatively short period of the year, pressure which is enhanced by an immense proportion of the produce exported having to be shipped from one or two ports. The railways are judged by their success or failure during this busy period, and little or no allowance is made for difficulties of organising traffic economically to meet the varying demands at different times of the year. But I do not deny that there is truth in the charge, and the railway policy of Government in the last few years has aimed steadily at its removal. The rate of progress has had to be conditioned by finance, but at least Government have had a clear end in view. Desirable and tempting as the further extension of railway construction would be, Government has consistently stayed its hand, and instead, has devoted far the larger part of the capital available in each year to the improvement of open lines and the provision of rolling stock. In the last 3 years the average proportion so utilised has been some three-fourths of the whole. My Hon'ble colleague the Finance Member dealt in his speech on March 1st, with the provision of capital for railways. I need only remind the Council that this year the sum of £12 millions is being provided, representing an increase of £1¼ millions over the revised figures for last year, and of more than £4 millions over the average expenditure during the 3 years 1909-10 to 1911-12. At the same time the question has been taken up of making it easier for the railway administrations to spend their allotted grants within the financial year and thus avoid lapses. Some of the causes which lead to lapses are outside our control; they depend on the activity of the English markets, the demand for railway material in other countries or the occurrence of labour troubles. But in so far as they depend on our machinery for financing railways, they are being closely examined and good results have already shown themselves in the current year, in which the anticipated lapse seems likely to be much smaller than recently. I hope that an even greater improvement may be achieved in future.

Sir T. R. Wynne in introducing the Railway Budget supported the Railway Member and and urged that with the funds allotted the best under the circumstances had been done. He said :—the budget statement shows that the net results of the working of the State-owned Railways of India for the year 1912-13, has been the sum of £5,653,000 sterling as compared with £3,800,000 for the previous year, an increase of nearly two millions sterling.

Taking a period extending over 16 years, from 1896-97 to 1912-13, during the first eight years of this period, the gross receipts rose by 11 crores; during the second period they rose by 21½ crores, or for the whole period by 22½ crores. Furthermore, the percentage of working expenses in 1912-13 has been the lowest on record.

Now, the railways of India could not have earned such largely increased gross receipts unless the funds available had been judiciously spent on a fixed and steady policy. The charge made that there has been no such policy is not borne out by the figures before you. Whether the progress of development has been equal to the growth of trade is quite another point. The Hon'ble Member in charge of the Department has already dealt with the recent congestion and the efforts which are being made to meet it, and I will not therefore take up further the time of the council in discussing it but I wish to make it very clear that I am not in any way arguing that we should rest satisfied with what has been done.

Turning now to what is actually being done in railway working. As you know, the major part of our railway grant is being spent on open line improvements. Lines are being doubled, terminal facilities enlarged, large accommodation is being provided at junctions, and, in fact, all works which will increase "carrying capacity" are being pushed on. Last but not least, large orders have been placed for locomotives and waggons. Though not much money has been available for starting new lines, it must not be thought that the construction of the new lines has come to a stand still. For the year 1913-14, a sum of 350 lakhs will be spent on lines now under construction.

Opening for Business.

[For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

COFFEE.

A Joint Stock Company in Australia whose representative is now in India desires to get into touch with large suppliers of Indian coffee first hand if possible. (B236)

MUNJ FIBRE.

An Indian firm at Agra is desirous of getting into touch with Bombay exporters of munj fibre (*Saccharum Arundinaceum*). (B237)

COTTON WASTE

A firm in Antwerp is desirous of getting into touch with Calcutta exporters of cotton waste. (B239)

JUTE BAGS.

A firm in British Columbia is desirous of communicating with shippers of jute bags. (B240)

JUTE SACKS.

A firm in Santiago de Cuba desires to be placed in communication with shippers of jute sacks. (B241)

ELECTRICAL MACHINERY.

A Manchester Engineer is desirous of corresponding with importers of electrical machinery, materials and supplies, with a view to being appointed as agent for the purchase and inspection of such goods in the United Kingdom. (B242)

BLEACHED AND MERCERISED YARNS.

A buyer in Chandernagore is desirous of being placed in communication with agents in Calcutta of bleached and mercerised yarns. (B243)

SULPHATE OF NATRIUM (OR SODIUM).

The Manager of an estate in Java desires to get into touch with Calcutta exporters of sulphate of Natrium (sulphate of soda), known commercially as Glauber's salt and in the vernacular as *Khari* salt. (B246)

DIVI-DIVI.

A firm in Raneegunge is desirous of communicating with sellers of divi-divi in Bengal. (B244)

OILSEEDS, ROUGH JUTE AND TALLOW.

A firm in Geneva desires to be placed in communication with exporters of oilseeds, rough jute, and tallow. (B245)

WHEAT.

A firm in Spain is desirous of getting into touch with exporters of wheat. (B247)

WHEAT FLOUR.

A firm in Spain is desirous of getting into touch with exporters of wheat flour. (B248)

ELECTRICAL FITTINGS.

A London firm is desirous of getting into touch with importers who wish to appoint buying agents for electrical fittings in England. (B250)

INDIAN HAND-MADE SILKS.

A London firm is desirous of getting into touch with exporters who wish to appoint selling agents for Indian hand-made silks in England. (B251)

BUILDING, MINING AND RAILWAY MATERIALS.

A merchant in England is desirous of communicating with firms disposed to appoint a buying agent in London for building, mining and railway materials; hardware, electrical plant and brass and copper tubes, plates and rods, etc. (B252)

TEA SEED OIL.

A London firm is desirous of communicating with exporters of Tea seed oil, known also as Camelia oil. (B253)

HEMP-SOLED BOOTS AND SHOES.

A firm in Hyderabad is desirous of getting into touch with British manufacturers of hemp-soled boots and shoes. (B254)

ROPE SOLES.

A firm in Hyderabad is desirous of getting into touch with makers in India or abroad of rope soles for boots and shoes (B255)

The Economic World.

The Birth-rate in France.

The proceedings of the National Commission on Depopulation, which consists of over 100 members, including several ex-Prime Ministers were opened on November 24 in Paris, with a speech by M. Klotz, Minister of Finance.

M. Klotz called attention to the gravity of the situation, and mentioned that in 1910 the excess of births over deaths in France was only 71,418, while in Germany it was 879,113, in Austria-Hungary 573,520, in Great Britain 413,779, and in Italy 451,771. Indeed, in the years 1906 and 1911, the number of deaths in France, although gradually diminishing, had exceeded the number of births. In some of the other countries which he had mentioned, a diminution in the birth-rate was also recorded, but it bore no comparison with the diminution in France, which, if unchecked, would lead to "military and economic inferiority, and a weakening of the expansive power of France in the world." Another feature of the statistics was that in 1908 there were in France 1,350,000 unmarried men over 30 years of age, and a somewhat larger number of unmarried women. There were 1,804,710 families without children, 2,966,171 families with only one child, 2,661,978 families with two children, 1,643,415 families with three children and only 967,392 families with four children. The total number of families with four children and more was only 2,328,780.

He dealt in detail with some of the evils, moral, social and economic, which had brought about this state of affairs, and with the remedies which the Commission propose to consider. Among the latter, he mentioned measures of hygiene and factory legislation, as well as the question of the housing of large working class families. The Commission would also examine the possibility of ameliorating the financial position of the parents of large families. There were difficulties in the way of a reduction of taxation in the case of such parents, as that course entails the imposition of heavier burdens on the rest of the community, but he thought that the Government, without the intervention of Parliament, could favour the parents of large families in appointments to public offices, and could help the children by giving them a preference in the allocation of school bursaries. The Senate was about to consider the Bill for facilitating the erection of cheap working class dwellings which the Chamber had voted last July.

Indian Capital and Indian Economics.

Mr. M. B. Bhargava has contributed an article on the "Incidence of Indian Capital upon Indian Economics" to the February—March number of the *Hindustan Review*. He starts by limiting the meaning of the term 'capital' so as to mean money intended or set apart for industrial and commercial pursuits, and goes on to discuss the subject in the light of his definition.

One of the cardinal propositions of Economic Science is, in Mill's words, that 'Industry is limited by Capital.' The backwardness of Indian industries can, to a great extent, be traced to the shyness of Indian capital. Though there are in India factories which are run on very gigantic scales, for instance, the railways, the jute factories and collieries in Bengal, they are worked by foreign capital. The poverty of India is, no doubt, a great deal responsible for this paucity of Swadeshi capital, but that is certainly not the sole cause. The spirit of hoarding money is regrettably rampant in the richer classes and the tendency to convert their savings into massive ornaments and jewels has become, according to the writer, almost chronic. The words 'credit' and 'exchange' are almost unknown to the monied classes and investment is purely a Western Institution.

For accumulation of business capital, one thing is absolutely essential and that is 'Credit.' Credit is only transfer of capital from incapable to capable or from less capable to more

capable hands. Some men can employ capital in better ways than others, but if they have no capital, their life is merely an unproductive existence so far as the economic world is concerned. On the other hand, huge sums of capital in inefficient or incompetent hands are annihilated for want of sufficient skill for putting them to productive uses. But if credit exists and the capital which is in the hands of the layman is lent at interest to experts, and if thereby confidence, on which credit is grounded, is allowed to increase, even the small savings of comparatively poor classes are made available for productive uses. The principal instruments for this object are the banks of deposit. "It is with no small regret that we have to pen about the fewness of such banks in India. Of course, there is the imperial savings bank in every important village, but in spite of its offering better security to the public for depositing their savings, we do not derive much good from them in so far as the country's interest as a whole is concerned. What one would wish is that there should be an indigenous bank in every town of note and the advantages of indigenous banking are obvious.

The question that arises next is whether these banks should be purely private or joint-stock concerns. In the opinion of Reginald Murray, Chief Manager, Commercial Bank of India, Calcutta, the system of joint stock banks is better than that of private banks, because they offer more certain securities to the depositor and are less partial and more consistent, in their methods of distribution. The practical absence of co-operative credit in India can be traced to social peculiarities of the people.' The writer observes, we Indians are still very backward in respect of banking chiefly because we have not yet evolved an advanced stage of national sentiment when the individual feels that his interests are bound up with the interests of the community and whatever advances the latter is calculated to advance the former. The difficulty lies chiefly in the mofussil where mostly the money is held in large quantities and those people who can help in bringing it out for productive investment will be rendering a real service to the country.

The Law of Increasing Return.

Mr. J. W. S. Davidson, M.A., in an article on the above subject contributed to the January number of the *Socialistic Review* defines the law of Increasing Return as being, in its more general form, the tendency in a growing industrial community for the productive capacity to increase at greater rate than that of the growth of population ; and as referring in its narrower sense (in which sense he considers the subject) to the known fact that the profitableness of a business increases as the extent of its operations grows and its organisation develops by reason of the "*internal*" and "*external*" economies which can be effected.

He then says that where a business is conducted on a large scale, the owners are able to effect in all directions numerous small economies, which amount *in cumulo* to a substantial advantage over their smaller competitors. The day of the small manufacturer, except where he acts as a feeder to some larger concern, is rapidly passing away.

It is in America which is the paradise of the individualist, and the home of "Liberty" that Trusts hold unbounded sway, and the law of increasing return has been allowed full scope. The Trust System has succeeded very well there because of the tariff reforms and protectionist methods. The chief aims of the Trust are the elimination of competition and the establishment of *Monopoly*, with a view to fix up prices at a figure most remunerative to itself, irrespective of the "*fair*" value of its goods or the rights of the consumer.

As applied to any particular branch of industry, the law of increasing return simply means that *under competitive conditions* an industry is carried on by a large number of different concerns, some large, some small and others moderate in size, all working to produce the same kind of goods but without any connection between themselves. As applied to such concerns, the law holds good that the

smaller the business the greater is the relative cost of production. The method of studying the phenomena of production at the margin,so favoured by the orthodox school, however useful it may be as applied to problems involving the law of diminishing return, is certainly *not* suited to those involving the law of increasing return, which law explicitly states that the greater the scale of a business—*i.e.*, the farther the application of the marginal dose of capital and labour is postponed—the lower will be the proportionate cost of production. The great aim of the manufacturer is to manufacture and sell the largest possible quantity of goods that his works can produce.

If we assume a period of normal trade, says the writer, we shall find the smaller or less efficient producers working at the margin of production—*i.e.*, after meeting the various expenses of their business, cost of materials, wages and salaries, depreciation, general expenses, and earnings of management, they will have just sufficient profit and no more to return them the normal interest on their capital. The larger or more efficient producers will be working at a smaller cost ot production, and they will have a surplus of profits beyond the normal interest on their (larger) capital; while the very large businesses will have a still more substantial surplus. There can be no question, of course, that surplus profits are due to organisation on a large scale, but if that organisation in a sense originates with the capitalist, it is an organisation of workers, and from their organised labour alone does the surplus arise.

The writer next assumes a boom in trade, as a consequence of which not only will existing concerns produce to the limit of their capacity but new concerns will also spring up to add their quota to the stream of goods produced. But this state of things cannot continue long, as, in time the supply will become greater than the demand. And the overproduction of goods may cause a severe depression in the country, with the result that profits may even disappear altogether.

The true nature of surplus value or profit-rent should now be clear. The capitalist system is not content with the production of surplus value from the labour of the people. The Stock Exchange is not concerned with the actual cost value of the capital employed in any undertaking, and the value of that capital on "Change" is not determined by reference to such real value. All that the stockbroker wants to know is what income the undertaking may normally be expected to yield, and, *apart from questions of risk*, he capitalises that income at a certain percentage (say three per cent. to four per cent.), and he buys or sells at the figure so arrived at. It is the existence of these purely artificial values which gives to the system its peculiarly speculative character.

A still more important deduction from the law of "Increasing return" has reference to the difficult question of wages. The relative remuneration of the different classes of labour, from that of the pure manual labourer to that of the highest administrative talent, will vary roughly according to their special qualifications. Skill, has, in fact, a certain monopoly value enabling its possessor to secure for its use an enhanced price. But the wages of the artisan and pure labourer are generally below their fair produce value. The writer then suggests that the rate of wages at the margin of production, which is itself conditioned by the general standard of comfort and the economic development of the community, determines the rate payable throughout the industry.

The inevitable result of the law of increasing return is seen in the remarkable developments throughout modern industry and commerce in the way of cartels, combinations and trusts which are all organisations, peculiarly characteristic of modern capitalism, and which seek to create a quasi-monopoly. Once monopoly is established, prices are sure to go beyond their competitive level and the consumer like the worker will be mulcted for the gorging of the capitalist. The working classes, who form the great bulk of consumers pay double toll to capital-first, on the

produce of their labour, and secondly, on their means of consumption.

The results of the law of increasing return cannot be checked or shirked. Production continues to be organised in ever larger combinations, culminating in forms of monopoly, which will become more and more obviously inconsistent with social well-being and social justice. Sooner or later, the State will have no alternative but to enter definitely upon the economic arena. No other course is possible. The writer concludes by saying that the only logical conclusion of the law of increasing return is Socialism.

How Labour will Absorb Capital.

An American writer describes his experience of the astonishing success of industrial 'profit-sharing,' in the February number of the "*World's Work.*" He believes in the labourer being a shareholder in every branch of business, if success is to be achieved in that business.

The writer says: "The United States Steel Corporation resolved to adopt the policy of interesting its officers and employees in its shares. "Every employee a shareholder" would prevent most of the disputes between capital and labour, and this chiefly because of the feeling of mutuality which would be created, now, alas! generally lacking.

To effect this, every corporation could well afford to sell shares to its saving workmen, giving preference in repayment at cost as a first charge in case of disaster, just as present laws provide first for the mechanic's lien and for homestead exemption.

The world of labour has advanced from the slavery of the labourer to the day of his absolute independence when he begins to take his proper place as the capitalist-partner of his employer.

The idea of making workmen shareholders and dividing a percentage of the profits among those rendering exceptional service will probably encounter the opposition of the extremists on both sides. But this problem will be solved."

The writer instances the Filene Stores of Boston, where this problem has been solved and admirably worked out in all its details. The capital stock is held only by the employees and is returned to the company at its value should the employee leave service. Complaints about wages, scope of work, tenure of employment and all other questions are submitted to an arbitration board. There is a welfare committee of shareholders managing a club-house and recreation rooms. There is an insurance committee furnishing five classes of assurance at cost price. There is, besides, a publication committee issuing a monthly paper. "We are just at the beginning of profit-sharing, and the reign of working men proprietors", says the writer, "and there is a field capable of wide and immediate extension provided the employers agree to fix a minimum wage sufficient to maintain economically the worker's household, and to this it is believed every fair-minded employer would gladly agree."

In the opinion of the writer, the next step towards improved labour conditions is through the stage of shareholding in the industrial world, the workman becoming joint owner in the profits of his labour. One of the greatest advantages of such a system, the writer thinks, will be found in drawing men and managers into closer intercourse, so that they become friends and learn each other's virtues. Co-partnership tends to bring to both labour and capital a realising sense of the truth that their interests, broadly considered, are mutual. The writer concludes by saying that the ideal condition of the future lies not in State-owned factories and mines, uniform wages to workmen, and the abolition of private capital, as Socialists urge, but in uniting the workman and the capitalist in one and the same person.

India and the Tariff Problem.

At a meeting of the Imperial Legislative Council held on the 17th March, Sir Gangadhar Rao Chitnavis moved :—

"That this Council recommends to the Governor-General in Council the desirability, in view of the loss of the opium revenue, of considering financial measures for strengthen-

ing the resources of the Government, with a special reference to the possibility of increasing the revenue under a system of preferential tariffs with the United Kingdom and the Colonies."

In moving the resolution, he said :—Such a motion in a year of abounding prosperity requires a word of explanation. The revised estimate shows an improvement in our revenue of over six million pounds sterling (£6,191,000) to which the opium revenue and the railway receipts have principally contributed. A superficial examination of the financial statement discloses no need to discuss possible additions to the resources of Government. I may be asked what urges me to these Cassandralike prophecies of the approaching demise of a revenue which has just shown such unexpected signs of vitality. I reply, Sir, that though our opium revenue has died hard, it is none the less dead. The position therefore is this. The opium policy of Great Britain has driven a huge breach in our finances. In the ensuing year, we have managed to maintain equilibrium between income and expenditure ; but we cannot expect to maintain it for long. Not even our largest sources of revenue—land revenue, railways, excise—could be expanded sufficiently to make up a deficit of 5½ crores, which may be taken as our normal opium revenue in the days before the commencement of the policy of suppression. These sources too are utterly unstable.

FRESH TAXATION INEVITABLE.

They depend on the seasons and the rainfall to such an extent that, as the Finance Member will allow me to remind him, he has himself described the Indian budget as a gamble in rain. We cannot forego this revenue altogether. India is a country not yet fully developed, and we need all our resources for that purpose, if for no other. There is only one course open, namely, fresh taxation. Taxation has its limits, and a wise Government will only impose fresh taxes with great caution and in a manner as little burdensome to the people as possible. None the less, fresh taxation will soon be inevitable, and in my view, it is advisable to face the fact and consider the remedy at once.

The Finance Member has said "should financial trouble come on her, India is prepared to meet it—*L'India fara da se.*" Sir, India cordially responds to this adaptation of Cavour's spirited retort on a memorable occasion in Italian history. India is self-reliant, as she has always been, but she must also be free to utilise her resources solely to her own interests. Give her fiscal autonomy, and she can brave any danger. Give her that, Sir, and she will cheerfully forego her just claim on the Home Government for the heavy loss entailed on us by their opium policy. But of this question of compensation on another occasion. The issue I now ask Members to consider is, what should be the form of additional taxation, should such taxation become necessary? On this point I hold strong opinions. I will not have any additional tax except on the manufactured goods imported into India, and that too either as a protective duty or as an impost under a system of preferential tariffs.

PROTECTION A NECESSITY.

Sir, I have said more than once that protection is a necessity to us. We have infant industries to protect. Granted even that, as free traders assert, we lose wealth thereby, yet wealth is not the only thing that nations desire. France and Germany have to be "protected," so as to become self-sufficient, lest they become ecomomically dependent on a possible foe. We want protection because we have to find employment for our people and to foster our growing industries. We shall, possibly, lose wealth thereby, but we shall gain those benefits in exchange. The true question is not whether free trade or protection is the most profitable policy; but whether the benefit that we expect to get from protection is worth the price that we shall pay for it. Sir, I contend that it is. But our hands are tied. Britain, who maintains free trade because, and *only* because, she can

afford free trade in virtue of her geographical position, will not allow us to adopt a protective tariff. Even a 5 per cent. *ad valorem* duty on our imports of cotton goods, imposed purely for revenue purposes, was resented in Lancashire; we know with what results. Yet this 5 per cent. duty alone, would yield us 2 crores of rupees and would by itself go far to place Government once for all above want. Not only that; we cannot even retaliate upon foreign nations. We have to bear the 100 per cent. tax on our tea export in Austria and France and the 246 per cent. tax on the same commodity in Russia. Our coffee and our tobacco are equally heavily taxed. In a word, we are not only not allowed by England to protect ourselves against her—which is intelligible perhaps,—but we are not allowed by England to protect ourselves against foreign countries. And that, Sir, I maintain is neither intelligible nor fair. Therefore it is we want fiscal autonomy, as I have said. But we may as well recognise fully and frankly that we shall not get it for the mere asking, and that the grant of it will be perhaps for years outside the realm of practical politics. In the absence of complete freedom of action in the settlement of our tariff, a protective tariff is equally unattainable. An alternative scheme is, however, available, which might be more acceptable to England, namely, a system of preferential tariffs as provided in the resolution.

Sir, the British empire is indebted to Mr. Chamberlain for this new gospel of inter-empire preferential tariffs. The idea may not be absolutely original, in view of the fact that the German Zollverein, or customs union among the different units of the German empire, was formed so far back as 1834, but for the British empire it is entirely new. Since 1902, when the colonial prime ministers at their conference in England adopted a resolution in favour of preferential tariffs, English economic opinion has undergone a great change, and, notwithstanding the recent temporary set-back in the movement due to the exigencies of party politics, tariff reformers are a power in England. The idea has caught on. It is bound to develop in England, flanked as it is by a protectionist Europe on one side and a protectionist United States on the other. India has so far not been admitted, so to speak, to the confederacy, but in any rational scheme of preference she cannot be ignored. It behoves us now to claim our legitimate place. In this matter at least, I hope, ours will not be a cry in the wilderness.

DESPATCH OF 1903.

Sir, the Government have gone fully into the question of preferential tariffs in their relations to India before this. In their published despatch to the Secretary of State of 22nd October 1903, they subjected it to careful analysis, and in their considered opinion, I must admit, India could not "expect very material advantages in the Imperial market by any measure which appears to be within the range of discussion." The foundation of this conclusion was the absence of proper data, as will appear from the following observation in paragraph 15 of the despatch :—

"We cannot feel confident that the conditions and requirements of foreign industries have yet been ascertained with the precision and fulness necessary to make them a sufficiently broad and stable basis on which to rest a fiscal policy of very problematic value to India, whilst the consequences of failure might result in irreparable disaster."

At the same time Sir Edward Law, after an elaborate examination of the conditions of our sea-borne trade, in his Minute, held :—

"I feel sufficiently confident that with the great majority of the countries with which we trade, and as regards the very great bulk of our exports of raw material, we are not only in a safe position, but we could even afford, in certain instances, ourselves to assume the aggressive by going so far as to impose duties on the exportation of produce they require for their industries."

And further. "In my opinion, it might be difficult to show that a preferential trade would prove directly prejudicial to Indian interests." In my humble opinion an analysis of the subsequent history of our seaborne trade will only confirm this last conclusion. The last ten years have brought into greater relief the circumstances noted by Sir Edward Law. "The position of India is more to-day than ever before, one of considerable defensive

strength." In explaining this statement I will not weary the Council with many figures. In 1910-11 for which we have complete statistics, our imports were valued at 129 1 3 crores, of which forty crores came from foreign cuntries. In 1906-07, the foreign imports amounted only to under 28 crores; so that in five years there was an increase of 45 per cent. Our exports in 1910-11 were nearly 206 crores of which over 118 crores went to foreign countries.

WAGING OF TARIFF WAR.

At first sight these figures would seem to show that our position in waging a tariff war with foreign countries would be weak. We could only tax 40 crores of their goods, while they could retaliate on 118 crores of ours. But our exports are of a totally different kind to theirs. Much the greater part of our exports consist of raw materials of all kinds which the foreigner requires for his manufacturing industries and dare not tax too heavily lest he should damage those industries. Not only so, but as regards some of our exports, jute for instance, India is practically monopolist; and the foreigner if he wants these goods must buy from us. As regards the rest, the cheapness of Indian produce gives us an advantage in any market and makes it difficult for any other country that produces the same materials to compete with us. Consequently, it is only a minor part of our exports that are taxable in any tariff. On the other hand, the bulk of foreign imports consist of manufactured goods, which we could tax without loss to ourselves, and in some cases, when we produce the same goods, with actual benefit to our industries. The chances of retaliation on the part of foreign countries are remote, for it would hurt them more than it would us. I submit that Government has been somewhat unnecessarily nervous in this matter.

A more detailed examination of statistics will but strengthen my argument.

Let us briefly investigate our position in relation to some of the chief foreign countries concerned. China must be left out of account. Customs duties have been settled by treaty with that country till at least 1922. But take Austria-Hungary. All our exports,—consisting of raw cotton, rice, raw hides and skins, raw jute and seeds,—except rice are duty-free, because they are required for local industries; whereas our imports consist of manufactures, the most important being sugar, glassware, apparel, cotton goods and hardware. Except wheat, in which there is competition, our exports to Belgium are 'untaxable.' Raw cotton, rice, raw jute, myrabolams, hemp are exports which Belgium will find it difficult to do without. But without much inconvenience to herself India could tax heavily Belgian cotton goods and glassware, and even Belgian steel and iron. Preference shown to the United Kingdom and the colonies in this matter of steel and iron will benefit them considerably, and might ultimately create a diversion of the trade in their favour. France levies an import duty of 97 per cent. upon Indian coffee and a duty of 46 per cent. upon Indian wheat. This last duty cannot be enhanced without fatal effects upon the semolina industry of Marseilles for which Indian wheat is alone suited. The heavy duty upon coffee has not prevented so far the normal growth of our export trade in that commodity. In 1902-03 the value of coffee exported to France was something over £200,000, and on the average of the last seven years it is £301,000. Seeds, raw jute and raw cotton, which account, on the average, for £5,852,000 of the Indian exports to that country, are from their nature untaxable. Besides oilseeds are wanted for oil industry of Marseilles. French retaliation is not therefore a serious factor in the question of preferential tariffs. The most important Indian export to Holland is rice (an average of £1,024,000 a year), but it has all the advantages of a raw material. On the European continent rice is not wanted for edible purposes (except in the Balkan Peninsula), and is imported for breweries. Germany apart from Great Britian, is India's chief customer, and the same advantages mentioned in the case of the other countries assure to Indian exports a ready market there. So many German industries depend upon the Indian supply of raw material that a violently aggressive attitude towards India on her part is practically impossible. Germany is anxious for the development of her industries, and the anxiety is reflected in her tariff. Any serious disturbance of that tariff is unthinkable. Our imports from Italy are not of serious importance, but heavy import duties on Italian marble, cotton goods and silk goods could be imposed without fear of our expulsion by retaliation from the Italian market, for our exports consist of raw cotton, raw hides, raw jute and seeds. An import duty of 7 per cent. is now imposed upon the raw cotton without much injurious effect, the average of the last seven years being £1,986,000 A heavier duty will only curtail her own supply of raw material. The United States of America purchase on the average £2,243,000

of our raw hides and skin, £1,336,000 of raw jute, £3,859,000 of jute goods, £233,000 of tanned hides and skins, £247,000 of seeds and £809,000 of lac. There is a 20 per cent. duty upon tanned skins. The heavy taxation of jute goods and tanned hides could be effectively checked by the imposition of a heavy export duty upon raw jute and hides and the consequential stoppage of the supply. Japan imports from India duty free, raw cotton (£6,191,000), rice (£730,000), jute goods (£114,000), tanned hides (£53,000) and manures (£56,000). She would suffer from the imposition of heavy customs duties upon these, as the raw materials, except rice, are wanted for her industries; whilst we could tax her silk goods, cotton goods, matches and apparel with great advantage.

India has nothing to fear from retaliation if she should put a protective or heavy tariff on foreign imports; she is strong enough to wage a tariff war well-nigh with anybody. But it may be asked, "Even if this be true, what has India to gain by a scheme of Imperial preference? Her exports to the United Kingdom, for instance, are much smaller than her imports thence; she will have to give a preference in a great many things, and receive a preference in a very few." Sir, I admit the premises, but I deny the conclusion. It is true that we ask for very little favourable terms for our cotton goods, our sugar, our tea, tobacco and coffee; and it is true that we can give a great deal.

IMPERIAL SOLIDARITY.

But I maintain, that this is not a question to be treated in the spirit of a petty huckster lamenting over a one-sided bargain. There are other advantages to be reaped from Imperial Preference, of which I need but mention one as an instance, the solidarity of the Empire. And I also maintain that our position is *not* a weak one. If we ask but a little and are able to give much in return, it should make it all the easier for the other parties in the bargain to accord us better treatment. A Customs union with the colonies would gradually secure for us there a better and more dignified position than we now have. Besides, what may seem little to other people, may mean to us a great deal.

As for the results, I can foresee none to make us pause. There will be no inconvenience to the poorer consuming classes. The conveniences of life which we so largely import will be as easily accessible to all as now; more than will come from countries with which we are so closely connected, and that is all. They will have in that case to see and wish for our greater prosperity in return. There will be no danger of diminution in India's favourable balance of trade, so vital to a debtor country; for her total volume of exports will not be affected to any extent, and a mere diversion of them from foreign countries to the Empire cannot damage Indian interests. But for complete success we want fiscal autonomy in this scheme also.

It is superfluous to add, Sir, that a scheme of preferential tariffs with the United Kingdom and the Colonies presupposes the introduction in India of a tariff on the imports of these countries coupled with a heavier tariff on the goods of foreign countries, which latter tariff may not be protective in character, so long as it is heavier. The basic idea is of course protection, but the system differs from a pure protective tariff in that the units of the Empire act in concert to obtain protection against the rest of the world. Individual national existence is subordinated to corporate existence, and will lead in time to a great federated empire. India, Sir, desires to move in the matter of trade with other units of the Empire and to be linked up in that great federation.

Sir, it is possible to detect flaws in any general scheme of preference. Such a scheme is so complicated, so vast that nothing is easier. But let us not lose sight of the wood from the trees. Moreover, "needs must when deficits drive" and the financial needs of Government force it on our serious consideration. Additional taxation, in all human probability, is inevitable. Here is a direction in which money can be raised in sufficient quantity, and a method which will not only be productive of revenue but stimulating to industry. Government cannot sit quietly in view of the danger to their resourses. A policy of *laissez faire* is ineffective action, determined action, is necessary. My position is this. The best way out of our difficulty is the adoption of a protective tariff, and failing that, of a system of preferential tariffs with the rest of the empire. If sufficient fiscal freedom for these purposes is refused us, I claim the liberty at all events to put on such duties on foreign imports as will give us the revenue we need *now*, which at a later date can be worked into a scheme of preferential tariffs if the chance arises. One or other of these courses we must follow if we are to remain financially solvent. And I advocate the second, as both practicable, beneficial and expedient. Sir, with these remarks I commed the resolution to hon. members for acceptance.

The Financial World.

A State Bank in India.

IN a special article published on the 14th March, the "*Times*" gives grounds for the establishment of a State Bank in India It points out that the Presidency Banks are inadequately capitalised and are incapable of attaining full development which would be possible if all parts of the country were open to them. They are debarred by law from raising money in the English market, but a central institution with a substantial capital should obviously be allowed under the supervision of the India Office, and should have an Agency in London, to transact ordinary business connected with the maintenance of the gold standard. This would unquestionably have a most salutary effect in securing the confidence of investors, and its adequate capital would tend materially to reduce discount rates. The Bank would serve the same purpose in India as the Bank of England serves for other Banks in England as feeder and supporter.

Banking Results.

The *Times* writes on January 23rd:—With the publication to-day of the reports of the London Country and Westminster and National Provincial Banks, the story of last year's operations of the leading banking and discount companies is sufficiently complete to permit of an analysis of the results achieved. In the matter of profits, 1912 was from the banking point of view, an excellent year, an almost general expansion in profits being shown. During the year, and especially during the second portion, the value of money was high, higher in fact than for some years past. The annual statement of the London Bankers' Clearing House showed how active business was, and active trade naturally helped to make money dear, although the outbreak of War between Turkey and the Balkan States was the principal cause of the advance in Bank rate to 5 per cent. in October. During the autumn, when the outlook was clouded by the war in the Near East, bankers were employed in strengthening their position in view of the possibilities of complications arising, and a feeling of confidence in the stability and good management of the large banking institutions resulted. During the whole year the margin between deposit rates and bill rates was a satisfactory one ; money throughout was employed at remunerative rates.

Gold Production in 1912.

According to the preliminary figures so far received, says the New York *Engineering and Mining Journal*, the gold production of the world in 1912 exceeded that of any previous year. The estimate for the year, based in most cases on actual returns for eleven months of the year, with a moderate allowance for December, places the total output at Dollars 469,618,083, or about 94 millions sterling. A comparison with previous years shows the following results :—

	Dollars.
1892	146,292,600
1893	158,437,551
1894	182,509,283
1895	198,995,741
1896	211,242,081
1897	237,833,984
1898	287,327,833
1899	311,505,947
1900	258,829,703
1901	260,877,429
1902	298,812,493
1903	329,475,401
1904	349,088,293
1905	378,411,054
1906	405,551,022
1907	411,294,458
1908	443,434,527
1909	459,927,482
1910	454,213,649
1911	459,377,300
1912	469,618,083

The output has been trebled within 20 years, and is still increasing, though at a slower rate. In the latest estimate, the figures for 1910 and 1911 have been considerably reduced, and it

now appears that there was a falling-off in the former year compared with 1909, and that 1911 barely attained the high level of two years before. The world's output is only sustained by the constant growth in the production of the Transvaal which was last year over three millions sterling higher than in 1911, when, in turn, it was nearly three millions sterling more than in 1910. The estimated output of the various gold-producing countries in 1911 and 1912 was as follows :—

Gold Production of Various Countries.

	1911 Dollars.	1912 Dollars.
Transvaal ...	170,059,273	188,285,000
Rhodesia ...	12,986,000	13,375,000
West Africa ...	5,197,488	7,379,000
Madagascar, etc ...	2,706,639	2,750,000
Total Africa ...	190,949,400	211,789,000
United States ...	96,890,000	91,685,168
Mexico ...	24,880,100	22,500,000
Canada ...	9,762,100	11,250,000
Central America, etc. ...	3,399,000	3,450,000
Total North America ..	134,931,200	128,885,168
Russia, includ. Siberia	32,151,600	27,750,000
France ...	1,707,100	1,825,000
Other Europe ...	2,584,900	2,595,000
Total Europe ...	36,443,600	32,170,000
British India ..	11,054,100	12,908.415
British & Dutch E. Indies.	4,726,500	4,875,000
Japan and Chosen ...	6,896,900	7,115,000
China and others ...	3,769,600	3 750,000
Total Asia, not including Siberia ...	26,447,100	28,648,415
South America ...	10,421,800	11,250,000
Australasia ...	60,184,200	56,875,500
Total ...	459,377,300	469,618,083

In addition to the Transvaal, the other African sources of gold supply showed an increase. The Asiatic mines also generally increased their production, especially those of the Kolar district, in British India, where deeper workings have restored the level which dropped in two or three of the principal mines in 1909 and 1910. On the other hand, the United States, Mexican, and Russian outputs fell off. Mexico continued to be affected by revolutionary disturbances, while Russia was injured by labour troubles and scarcity of water in many of the important places, notably those of the Lena Gold Mining Company, which has recently been the most important producer in Siberia.

The Finance Commission.

In the debate in the House of Commons on the administration of Indian Finances held on the 13th February Mr. Asquith announced as follows :—

I wish, in conclusion, to say that I think this question of balances opens up matters of very large importance. It opens up questions of the location and management of the balances of the Government of India, and the organization and responsibility of the financial side of the India Office ; and in their turn these questions lead up to a consideration of the system adopted in relation to the maintenance of the exchange value of the Indian currency. In all these matters, the India Office has lived on as a kind of survival and development of the old parent commercial company, the East India Company, and neither the Government of India nor the India Office is indifferent to their importance. We think, and they agree with us in the view, that, although an inquiry into matters so technical by a Select Committee of this House will probably not be the best means of obtaining any desirable result, we have reached a stage at which there should be a thorough investigation of these matters by an expert body—I think, in preference, I should say, a Royal Commission—at any rate by an expert body which can go into the whole question of the organization of the India Office, the use of the balances, the maintenance of the standard of currency, and in particular—it is most important in this matter to have Indian opinion with us—as to how far we are dealing fairly as between India and the United Kingdom in the manner in which we employ the surplus revenues. I think this debate will have served a very useful purpose if it enables us to put on record with the general assent of both sides of the House of Commons, that the time has come

to set up an inquiry which we hope will be attended with beneficent results both to the United Kingdom and to India.

In view of the severe criticisms passed upon the financial methods of the India Office in the Press, Platform and in the House of Lords and the Commons, the appointment of a Commission to sift the whole question was the only straight course open to the Prime Minister. A Commission of this sort had been suggested long ago in India. Thus the *Pioneer* wrote last year :—There is no doubt a certain class of pending questions might be advantageously placed under the consideration of a Committee, if it were composed judiciously and appointed quickly. The extension of gold coinage to the Indian mints, the character of the coinage they should turn out, whether a replica of the British sovereign or something distinctive, the suggestion of a ten-rupee and even of a five-rupee piece—all these are points whereon the public would be the better for more light, while the eventual decision of the Government would be fortified by having behind it the recommendations of a body of experts. Moreover, the questions indicated could hardly be ventilated without a further clearing up of a very important point in the theory of the subject—namely whether in the conditions of the Indian currency it is the amount of gold, in hand to hand circulation, that ultimately safeguards the stability of the token rupee, or whether, as newer authorities seem inclined to believe, the gold in circulation matters little or nothing, presuming that the central reserves are adequate. That is a question of great consequence and interest which can hardly be said as yet to have been fully probed and yet has a distinct bearing on future policy. Indirectly again, the appointment of a Currency Committee in 1912 would have a beneficial effect as freeing us from the strange domination which the Fowler Committee of 1898 seems still to exercise over the minds of those who enter into this controversy. Considering the circumstance under which this Committee sat, the glimmering and uncertain lights under which it came to its conclusions, the character of many of the alternatives it was called upon to weigh, the tentative and guarded nature of the language of its Report, the sense of responsibility which so evidently weighed upon it, confronted with the unknown possibilities of the future—it is extraordinary that people now should deal with the subject as if fidelity to its recommendations were the one test of sound policy. Is it to be supposed that fourteen years of trial and experience of the system then inaugurated have brought no increase of wisdom? A new Committee would in that respect gives us a fresh starting point and might be welcomed.

Naturally, the constitution of the Commission and the points to be referred to it for consideration, have evoked a feeling of nervousness in the Indian mind, the general experience being that, in matters economic and financial, the interests of India are sacrificed to the industrial and financial interests in England. The Hon'ble Sir G. M. Chitnavis therefore moved a resolution in the Imperial Legislative Council as follows :—

"That this Council recommends to the Governor-General in Council that the correspondence between the Secretary of State for India in Council and this Government relating to the promised Royal Commission for the investigation of Indian finance and currency, be laid on the table."

In the course of his speech, Sir G. M. Chitnavis observed :—The result will necessarily largely depend as much upon the personnel of the Commission as upon the scope of the inquiry referred to it. And, whatever might be said to the contrary, the people of India are the most deeply affected by the conclusions of that body. It is only fair and just, therefore, that India should claim to be heard at the earliest stages both about the constitution and the programme of the Commission.

INDIAN ABSORPTION OF GOLD.

The question of Indian finance and currency has caused somewhat of a nervous anxiety among Indians. The clamour of English bankers and bullion merchants against the

Indian absorption of a portion of the annual output of gold has been productive of considerable uneasiness in India ; and when the agitation moves the Premier to promise a Royal Commission for inquiry, the popular nervousness naturally becomes intense, and the public mind seeks relief in the fullest information available. Messrs. Montagu have complained of the Indian imports of gold ; so has Sir Edward Holden of the London City and Midland Bank, while Mr. Moreton Frewin has written a lot about what he calls "the awful hæmorrhage of gold to India." Indians feel sure this point of gold absorption of which we hear so much will bear the closest scrutiny. Apart from the fact that India has a perfect right to claim, if she chooses, that her debtors shall liquidate their debts in gold, which is the only legal tender for international transactions, it is an open question whether the alleged drain of gold to India is not itself a healthy tonic for European countries.

INDIAN CASH BALANCES.

The reserve is held against the note circulation to ensure immediate payment. How is this purpose served by withdrawing the cash to England, only to be locked up in securities? Again, there is the question of the ordinary cash balances held by the Secretary of State in the Home Treasury in London. During the past two years these cash balances have been very much in excess of what the Secretary of State requires for Home charges, and the Indian public would like to know how far the interests of India are served by the maintenance of these high cash balances which have been lent out at low rates of interest to approved borrowers in London.

INDIAN CURRENCY.

Finally, there is the question of currency on which widely divergent views are held in London and in India. If one may judge from the opinions which have been voiced in England during the past years, the form of currency which should be adopted in this country should be determined, not with reference to what the people of India themselves desire, but with reference to what it is convenient for Lombard Street to let them have. The view which I wish to emphasise is that it is of vital importance that all these complicated questions should be examined from the Indian standpoint, and should be decided upon with the sole view of aiming at the interests of India.

ADEQUATE INDIAN REPRESENTATION.

There is another reason why I move Government for the publication of the papers. In my humble opinion, on a Royal Commission of Inquiry into Indian finance and currency both this Government and the people should be properly and adequately represented.

The Finance Member replied that the constitution of the Commission was entirely a matter for the Prime Minister, and that he had no doubt that His Majesty would be properly advised in regard to Indian representation on the Commission. The Resolution was accordingly withdrawn.

There is a general consensus of opinion among the Anglo-Indian and Indian papers that Indian interests should be adequately represented on the Commission. Thus the *Pioneer* writes :—The composition of such a Royal Commission must rest in the main with the Cabinet at Home, though the Government of India will be consulted according to custom. The nomination of an official to represent the views of that Government seems indisputable, and the suggestion of Sir G. M. Chitnavis that a non-official Indian from the commercial community should also be appointed, will doubtless receive consideration. The European commercial community may equally press their claims to be represented. It has not been stated whether the Royal Commission will visit India but as in a case of this kind the greater part of the authorities, whether witnesses or members, are on the spot, the probability is that, following the precedent of the Herschell and Fowler inquiries the meetings will be confined to London. It is

out of the question to expect busy City magnates and learned Professors to come out to India for the sake of giving a day's evidence, but there are few Indian merchants or bankers who would make a difficulty about taking a run Home for the same purpose in the course of the summer. In that case, we hope, that witnesses from India—merchants and bankers particularly—will be summoned to give evidence.

The Times of India says :—It is most important that those who lead opinion in India should insist on this Commission being fully representative of Indian interests. It ought at least to include a representative of the Indian Finance Department thoroughly conversant with present conditions. It ought also to include the ablest of the Presidency bankers, and representative both of the English and Indian mercantiles communities.

The *Leader* points out:—After all, the interest of London merchants and financiers in the questions that are to be submitted to the Commission is secondary and selfish and not in all cases identical with the interest of the Indian tax-payer who is the party primarily and supremely concerned. It was a legitimate grievance of the Indian people that they were not represented by one of themselves on the Herschell and Fowler Currency Commissions. Their interests undoubtedly suffered on that account. The country has advanced since 1892 and 1898, and ought not to be ignored for a third time in the year of grace 1913.

The *Statesman* observes :—The composition of the body to which the investigation is to be entrusted is obviously of vital importance. This is essentially a case where expert knowledge and political impartiality are required, and unless the members of the investigating body command respect and confidence from the very outset, the enquiry must prove useless. It is especially to be desired that the politicians who, in their haste to injure their opponents, have displayed an inconceivable ignorance of the elementary principles of finance, will be rigidly excluded. The questions involved are far too important to India to be the sport of factious partisans.

Immediate Gold Coinage.

While there is unanimity as regards the representation of Indian interests, the papers are divided as to the necessity for the immediate coinage of gold in India. The *Pioneer*, and the *Englishman* would await the recommendation of the Commission, while the *Times of India*, and the *Punjabee* would have the gold coin at once.

Writes the *Englishman* :—We welcome the announcement of this Commission, because the financial arrangements of the India Office need investigation. It is not clear how far the Commission will be concerned with the question of the gold currency, but this is obviously a question that needs investigation as much as any other in the light of present day conditions. There is a strong feeling here in India that we should proceed to the logical development of the adoption of a gold standard and inaugurate a gold currency as well. In the main the arguments in favour of this are more sentimental than practical, and we believe we are right in saying that the coinage of ten rupee pieces—a mere concession to sentiment—has been seriously contemplated by the Finance Minister. Sentiment, however pleasing, must not over-ride practical considerations, and having regard to the feeling of alarm amongst currency experts caused by the expectation of the opening of the Indian mints to the coinage of gold, no serious step in this direction ought to be taken without careful inquiry by an expert Commission. Conditions have greatly changed since a Royal Commission last investigated the question of Indian currency, and the change is large enough to justify a searching examination of principles as well as methods.

The *Pioneer* says :—It seems natural to suppose that one result of the appointment of the Royal Commission foreshadowed by Mr. Asquith to deal with Indian currency and finance will be to suspend further action in the matter of the proposed Indian gold coinage,

It is evident that Lord Crewe in coming to a decision in favour of the coining of a gold ten-rupee piece was not moved by any strong convictions. He seems to have regarded the experiment as a concession to Indian sentiment; and he may have also considered that the undertaking of the new coinage in the Bombay mint would be a smaller business than the es'ablishment of a branch of the Royal Mint at Bombay, which would have been necessary for the coinage of sovereigns and half sovereigns. In any case now that the whole case is to be delivered over to a Commission of experts, it would be strange if a point like this were to be prejudged on the eve of its appointment.

The *Times of India* however writes :—But what is still more important is that some assurance shall be given that the appointment of the Committee will not be allowed to delay the establishment of a gold mint in India. That question, as Lord Crewe has recognised, is ripe for immediate decision. It brooks no delay. If it is hung up whilst the Commission is sitting and preparing its report—which can scarcely be accomplished in less than two years—then the country may be further deluged with token coins and the currency position rendered infinitely more complicated.

And the *Punjabee* thus—It is also suggested that pending the result of the Commission, the measures already in hand as to the gold coinage in India, should not be postponed. The Government must be informed of the urgency of this and their assurance to this effect taken. Lord Crewe has already observed that the question is ripe for immediate decision and it rests with the Government of India to give effect to it now. If it be postponed, there will be further complications in the financial position and it is clear that should not be allowed.

Gold Coinage and Drain.

The following cuttings on the subject of Gold Coinage and the "aweful hæmorrhage of Gold to India," will be read with interest :—

British Empire Review—The problem of a gold currency for India is rapidly approaching solution. Not only is Northern India taking over two millions sterling a year into actual circulation, but sovereigns are in common use as currency. These facts are disclosed in the Paper Currency Report of Mr. Brigstock, Accountant-General of the Punjab and North-West Frontier Pro-vinces who made a special inquiry into the use of coined gold, not only among traders, but among the population as a whole. The reports of various district officers show that, with rare exceptions, the sovereign is freely current. The ignorant villager has a distrust of currency notes even of small values, but, as one Deputy-Commissioner puts it, "with the sovereign there is no trouble, no awkward questions are asked and no discount is taken." Land revenue is now largely paid in gold, and at a canal centre like Lyallpur the amount sometimes received in a single day runs into several lacs. The banks which play an important part in the finance connected with the export trade declare unanimously that gold is freely current. One agent has "no hesitation in affirming that sovereigns are rapidly taking the place of rupees as a medium of exchange throughout the Punjab." Another states that gold is invariably given the preference over silver ; and a third declares that the popularity of the gold coin is now beyond question—the educated classes prefer it to bulky silver, and the illiterate have a great fancy for sovereigns. All that is now required is for the Indian mints to be opened to the free coinage of gold, and India would be as well equipped, monetarily, as any country in the world.

Indian Daily News—Sometime ago, Sir Edward Holden was advocating the strengthening of bank reserves as a measure of protection against financial panics. Nothing particular has come of that suggestion, or rather the repetition of that old suggestion of his. He is now, we see, developing his constructive policy along new lines. He thinks the establishment of a gold coinage in India will lead to great absorption of gold

and consequent contraction of credit among gold using countries, and other dire things. Now, one may or may not agree as to the establishment of gold coinage in India; but one must admit that the absorption of gold will continue nevertheless. India must be paid for her surplus of exports over imports, and if India prefers to draw gold, instead of silver,—why, she will draw gold and there is nothing more to be said about it. Eminent bankers in London may hold up their hands in horror at the prospect, but India will not be uneasy on that account. It seems American financial circles are extremely sensitive on the point. It is a remarkable example of American interest in Indian affairs. Of course, they would much like Indian currency affairs being managed with some regard for Wall Street interest. But how is this to be arranged? Let it be granted that a gold mint in India will be an unspeakable outrage. The practical question is by what manner of means India is to be prevented from drawing 25 to 30 millions sterling annually, in payment of what is due to her. Sir Edward Holden makes no definite suggestion towards checking the inward flow of gold; but it is quite apparent he wants it checked by the adoption of a more stringent measure than the one in vogue of selling rupees in exchange for gold paid in London.

Again the same paper observes:—Sir Edward Holden's views about the Indian gold drain are very curious reading in face of the statements made of late years about the drain from India by people who dislike to study those things seriously. India is now drawing gold out of England and England is resenting it. One of the main factors of the situation, seems however, to have been overlooked and that is that all Continental countries are reserving their gold currency for the event of a war. In France, the comic papers are making a joke of the scarcity of gold. In Hanover, the banks were refusing to pay gold before the new year and people were arranging to share flats after March to keep down house-keeping expenses in expectation of a war in the spring. It has been the same in Berlin. Everywhere gold is being replaced by silver and notes. The Bank of France makes it quite unpleasant for a customer who asks for gold and silver is legal tender in France still, we believe. But it is gold that all are relying on. Hence is Sir Edward Holden's chief trouble, not India.

Mr. Moreton Frewen—"India is a debtor community. The Home Charges of her Government require from India an annual tribute of 17 millions, India pays this vast sum not by exports of gold, but by exports of her produce. The higher the prices these realise here, the less the burden of the tribute. The more of our gold she drains away from us to her hoards, the lower our prices will be in the future, and thus the greater the strain on her exports. In the future of India's competition with Japan for the market of China, how can Bombay with a rupee which costs sixteen pence compete with Japan, her yen rated to her gold standard as the rupee at ten pence?"

Financial America—An important new problem that has developed during recent years, the influence of which upon the value of world's money is not adequately recognised, is the huge absorption of gold by India. The remarkable growth of Indian trade has in the last few years built up a favourable balance in that country which almost places London money market at India's mercy. This financial year India has withdrawn 25% of the world's total gold production, and this does not appear to any extent in circulation of that country, but, by being hoarded or turned into ornaments, is practically lost to the world's monetary supplies. India's total gold imports in '09 were £10,077,472, in '10, £18,028,008, in '11 £23,366,814, and in the first nine months '12, £26,346,314. India is now absorbing far more gold annually than estimated to be consumed each year in arts and industries, an amount, in fact, not far short of the immense total production of Transvaal. This must be recognised as a factor that must have important influence in

maintaining existing international stringency of money.

Indian Spectator—In the year 1911-12, India imported gold bullion of the net value of 10,42 lakhs, and sovereigns worth 27,34 lakhs. The Punjab received the largest number of sovereigns, and the lead was followed in order by Bombay, Madras, the United Provinces, and Burma. The capacity to absorb sovereigns seems to depend upon the volume of exports from the province concerned, and to some extent on the preference shown by the dealers to one or other kind of currency. It seems that European merchants prefer to pay the cultivators in silver, but the cultivators generally prefer gold as being more portable and safe to carry and to preserve. It is often asserted that a gold currency cannot succeed in India because of the popular habit of melting the coins for ornaments and of hoarding. A special inquiry was instituted to find out what use the people were making of sovereigns, and for what purposes they were paid back into the treasuries and other public offices. It was reported from the Punjab that the officers consulted were almost unanimous, as also the banks, that the popularity of the sovereign as currency is greatly on the increase. From Bombay it was reported that gold was not being hoarded and melted now to the same extent as before. Until the country is "saturated" with gold, the statistics which throw light on hoarding cannot be considered altogether reliable, but as far as melting the coins for ornaments is concerned, it may fairly be assumed that it depends upon the price of gold bullion. When the price of pure gold exceeds Rs. 25 per tola, the goldsmiths are said to deem it profitable to melt and purify sovereigns. Otherwise they prefer to use gold bullion for ornaments. The general conclusion arrived at is that in northern India, Bombay, and part of Madras, the use of the sovereign as currency is steadily increasing, while in other parts of India it is still mainly used for conversion into oranaments or jewellery. Before a gold currency can succeed, its use in the jute trade of Bengal and the rice trade of Burma, to the same extent as it is already used in the wheat trade of the Punjab and cotton trade of Bombay, is considered necessary. The Secretary of State is in favour of introducing a smaller gold coin than the sovereign. Perhaps this will be less liable to be melted than the sovereign, but only experience can show which way the popular whim will work.

Clearing House Returns.

It may be of interest to contrast the scale of business in Calcutta and London. In the latter centre the grand total of the Clearing House for 1912 was £15,961,773,000. In Calcutta it was under £200,000,000, a return, however, which is gratifying as it evidences a steady and very material annual increase over the last three years, besides maintaining a very decided lead over the other four great centres of India where a clearing house is maintained. Some interesting comparative figures just published show that the combined total of the other four cities in respect of amounts, which pass through the clearing house, only exceeds that of Calcutta by a little over 3½ per cent. The actual figures may be of interest, and they are for 1912 in Calcutta Rs. 28,831 lakhs; Bombay Rs. 20,556 lakhs; Rangoon Rs. 6,043 lakhs; Madras Rs. 2,137 lakhs, and Karachi Rs. 1,146 lakhs. The rates of increase have been larger in Karachi than in any other centre. Apart, however, from the question of trade, these figures to some extent, indicate the progress of commercial education in the increased readiness to make use of the banking facilities that are available. If it were possible, it would be of interest to know how much of Calcutta's total represents cheques drawn by European firms, and how much comes from the bazars. In these days the transactions of the Marwari in Calcutta run into very large sums, and though in a good many cases payments are made by cheque, a very large amount of cash still changes hands, and there is a disposition in very many quarters to at once turn a cheque into rupees over the counter. This cannot arise from any lack of banking facilities, at all events in the cities and large trade centres, but is doubtless a relic of old-time caution, that prefers coin to paper in the shape of cheques, or sometimes even notes. To refer once more to the figures of the London Bankers' Clearing House given above we have a total for all India of no more than £400,000,000.

EDUCATION.

Victoria Technical Institute.

At the annual presentation of prizes at the Bombay Victoria Jubilee Technical Institute, H. E. Lord Sydenham declared that he owed much to the fact that he had made himself a fair carpenter, fitter and turner. He strongly advocated manual training in all schools, High and Primary. Lord Sydendam outlined a scheme for the improvement of the institute and proposed to move the institute from Byculla to another and more suitable site, the cost to be defrayed by the sale of present property, supplemented by a grant of two lakhs sanctioned by the Government of India, any deficit being met by the Government of Bombay. To help to meet the increased expenses, the annual grant from the Government of Bombay will be increased from Rs. 4,500 to one lakh and the Institute will henceforth be recognised as the Central Institute for techinal education in the Presidency.

Technical Education and Indians.

In the course of their report, the Committee of Enquiry on Technical Education, write as follows :—

The reasons why technically trained Indians have so far partially failed to meet the demands of employers seem to be—

(*a*) Certain races in India are more fitted by nature for this class of work than others. The prevalent opinion seems to be that certain races are not, on the average, naturally fitted for technical work. Their caste prejudices and necessity for religious observances are all against the possibility of successfully carrying out the necessarily rigid rules of workshop life. Though willing to work with their hands in technical institutions, they are mostly unwilling to do so when they enter the stern reality of the workshop and consider they need only supervise.

Employers state that men of certain races if they have passed any University Examination are unfitted for practical work, and consider themselves above it.

The Parsees, however, in this respect are very different, and Parsee graduates are willing to take up the humblest work to gain their practical experience in the same way the European has to do, and the Parsee graduate often turns out a first-class man.

(*b*) Most technical institutious up-to-date have, by force of circumstances, endeavoured to get posts for their students on leaving the institution and in most cases have thereby damned technical education in the eyes of employers.

It is the universal opinion of employers of labour in India, European and Indian, and a fact well-known to the practical world at large, that a man, however carefully prepared in a technical institution, college, or University, is utterly useless to an employer of labour till he has had practical experience. He must in all cases begin at the lowest stage and work up gradually in time. The extent and diversity of this practical work depend on the grade or specialized industry aimed at.

Commercial Education.

In the course of his speech on the opening of the Calicut Commercial School, the Hon'ble Mr. J. H. Stone spoke as follows :—

I cannot think there can be any doubt in anybody's mind that commercial education has a very great value. It is clear that the boy who has received a sound commercial training is in a much better position for earning his living than he would otherwise be. And it is also quite clear that without a knowledge of even the more elementary things that are taught in this school, such as account-keeping, it is impossible that you should have a very sound industrial work. Consequently those who are interested in the development of Indian industries must be equally interested in the spread of the knowledge of commercial subjects which are taught in this school. It is also-well-known that industry and commerce are inseparably connected and that any development of industry is likely to lead to the development of commerce. In fact, you cannot think of one developing apart from the other and for their just progress, commercial knowledge must be a *sine qua non.*

ECONOMIC PRODUCTS.

The Production of Petroleum.

The total production of the United States in 1911 was 7,713 million gallons, as compared with 7,332 million gallons in 1910, an increase of 381 million gallons. The output in the United States has increased by 1,900 million gallons in the five years 1907 to 1911. The oil fields of Russia yielded 2,124 million gallons in 1910, an increase of 81 million gallons on the output of the previous year, but more by 108 million gallons than the quantity shown by the provisional figures which are available for 1911. The quantity exported from Russia has, in recent years, been one-sixth to one-seventh of that exported from the United States. The combined production of petroleum in Germany, Austria, Rumania, Japan, Canada, British India, and the Dutch East Indies was 1,421 million gallons in 1910, and 1511 million gallons in 1911, being more than the exports from the United States by 23 per cent. in 1910 and by 11 per cent. in 1911.

Cotton Seed.

Speaking generally, people now eat and wear cotton seed products and do all manner of things with them. Observes the *Railway and Locomotive Engineering* (Chicago) :—The lintels yield batting, wadding, stuffing for pads, cushions, comforts, horse-collars and upholstery, mixing for shoddy, for wool in hat-making and for lambs' wool in fleece-lined underwear ; also for felt and low-grade yarns used in making lamp and candle-wicks, twine, rope, and carpets ; also cellulose used in making artificial silk and writing-paper, and as a basis for explosives.

This is not all. The hulls are used in feed, fertilizer, paper stock, and stuffing. The cake and meal are also used in fertilizers, in dye-stuffs, in feed for cattle, poultry, horses, and swine, as well as in confectionery and flour. The oil enters the manufacture of lard compounds, white cottolene, butter oil, cooking oil, salad oil, 'olive' oil, and oleomargarines. It is used in the packing of olives and sardines, in miners' oil, in lubricating oil, in paints, in mixing for putty, and in automobile tires. It is an ingredient of soap, washing-powders, etc. Altogether there are fifty-three products. Millions of capital and thousands of persons are employed in the industries growing out of the use of cotton seed in the United States.

Soy Bean.

The following summary of the uses of the soy bean and its products is interesting :—For dynamite and high explosives, soap, linoleum, India-rubber substitute, margarine, paints and varnishes in place of linseed oil, various edible foods, toilet powder, salad oil, vegetable cooking oil in place of lard, oil, etc , preserving sardines, lamp oil, lubricating, as food in place of peas, flour for soups, biscuits, brown bread, artificial milk and cheese, substitute for coffee, for sauces ; the cake for feeding cattle, and for manure. Four years ago these beans were sold in the London market at a spot price of £4 per ton, and now the price has more than doubled itself.

Separated Milk.

The dangers of an impure milk supply and the improvement of dairies are a subject to which much attention has been drawn in India during the past year or two. There is a note *apropos* the subject in the *Journal* of the Agricultural Institute at Pusa. It refers to the cream separators that are now seen working in many big cities of India. They make a large quantity of separated milk available for use and the *Journal* gives particulars of the feeding value of this milk Separated milk, it states, contains about 3-15 per cent , of casein which forms about 80 per cent. of the total proteid matter of milk and being a nutritious substance, the separated milk remains a valuable article of diet. Separated milk also contains mineral matter and when fed to animals helps in bone formation. Though it contains the whole of the proteid of the milk, it is nearly devoid of the fat which should be otherwise supplied. It is employed in the preparation of bread, biscuits, cakes, and sweetmeats. It can be used for calf feeding. The deficient ingredient in separated milk as stated above is fat and to make a perfect calf food, some carbo-hydrate must be added in a form easily digestible by the young animal.

INSURANCE.

Insurance of Business Houses.

'Pharos', writing in *Saddlery and Harness*, points out that every tradesman should protect himself by insuring against the several risks he daily has to run, *viz.*, workman's compensation, fire, burglary, accidents to himself, etc. Care should be taken to insure only with sound, reliable companies who have reputations of many years' fair dealing behind them. The rates charged by the various insurance companies do not vary much, but those companies whose rates are lower than those of the majority of other companies should be avoided, as they will not hesitate to use trickery to shirk or delay claims. With regard to fire insurance, care should be taken to insure up to the full value, as if this is not done, the insurance companies will only pay under the "average clause." Anyone taking out a new policy for fire insurance must be careful to study the terms of the policy in detail. If pressed to do so by the prospective insurer, some companies will specially agree in the policy to pay reasonable expenses incurred by the insurer in removing or protecting the insured property when threatened by fire. This they will not do if it is not a clause in the policy, and the insurer, before paying any premium or signing proposal form, should endeavour to secure the insertion of such a clause. It is advisable to bring the company liable for the destruction by fire of goods sent for repair, as, in a good business, such goods amount to a considerable sum, and if the company will not include this amongst the other fire risks, then an extra premium for the purpose should be paid and a special clause to that effect inserted in the policy.

An Insurance Ruling.

A very interesting and important judgment concerning life insurance has been passed by the Bombay High Court. The main point at issue was whether the policy on the life of the husband of a Hindu widow was liable to attachment and sale in execution of a decree against the husband by third parties. In this case, Umaibai, widow of Sadashiv Nilkant Wagle sought for declaration against Vishwanath Wagle and others, that the policy of the Oriental Life Insurance Company, of her late husband, was not liable to attachment and sale in execution of a decree obtained by Shankar Vishwanath Wagle and others against her husband. In the lower Court, the Judge decided in favour of the widow and the defendants appealed against this order. The Chief Justice and Mr. Justice Chandavakar disposed of the appeal. The Hon. the Chief Justice in delivering the judgment, said: The policy is attachable if it falls within the description contained in S. 60 of the Civil Procedure Code, a "security for money or other saleable property belonging to the judgment-de bto over which he had a disposing power which he might exercise for his own benefit." The policy is a contract between the deceased and the Insurance Co., expressed to be for the benefit of the wife of the assured, whereby the company promise, on proof of the death of the assured by separate writing, and in default of trustees to the beneficiary (*i.e.*, the widow of the assured), and if the beneficiary be dead, to the deceased's heirs. Unless and until trustees should be appointed on behalf of the wife, it was in the power of the deceased at any time to put an end to the assured by ceasing to pay the premia or otherwise to defeat the expectation of his wife by assigning the policy to a creditor. He would divest himself of his beneficial interest under the policy only by assignment in writing. He adopted neither course. The policy on his death therefore formed part of his estate, the right of action against the company being in his executors, untramelled by any trust in favour of his wife. After dealing with the law points and rulings, their Lordships held that there was nothing in the case to show that the plaintiff was either the promisor or the promisee and therefore a party to the agreement. There was nothing to show that a person not a party to the contract could sue on it. Their Lordships reversed the decree of the lower Court and dismissed the suit with costs throughout on the plaintiff.

MACHINERY, SCIENCE, AND INVENTION.

Sun Operated Motor.

Among important inventions of recent date is one of a practical motor deriving its power from the heat of the sun. The motor consists of a dozen or more oblong boxes having honey-combed compartments filled with water and covered with glass. The glass cover of each box is so arranged as to bring the sun's ray to a focus and heat the water, the steam being collected in a pipe which is common to all the boxes and conveyed to a low pressure engine of special construction, which is set in motion, and the exhaust steam condensed and rec-conveyed to the boxes by another common pipe. This is an American invention.

Police and Electric Belts.

The Indian police force may be interested to know that a new device has just been offered to the New York police officials. It consists of an electric belt to be worn by every man when on duty. The belt is connected with a battery, to which are attached wires that run up the back and down the sleeves to a button in a rubber glove worn on the hand. This button is guaranteed to make the toughest felon wilt when the policeman lays hands on him. If he shows any fight he gets an electric shock. The inventor also claims that the device could be used with advantage by keepers in lunatic asylums.

Artificial Sponges of Paper.

When paper pulp is treated with zinc chloride there results a viscous mass. Sodium chloride (or ordinary table salt) is added to this; the mass is then thoroughly rinsed with alcohol, and is finally submitted to the action of a press whose platform bristles with a number of fine metallic points or projections. These penetrate the mass, forming tubes like those in an ordinary marine sponge known as "*canalicules.*"

The block thus obtained is of a spongy consistency and is both insoluble and unalterable in water. It is smooth and pleasant to the touch, and is not susceptible of putrefaction. It is a very ingenious employment of the cellulose to which we owe so much.

Patents and Inventions in India.

It appears from the *Patent Office Journal* for 1912, which has just been issued from the Government of India Patent Office, that the applications for patents made in 1912 include many from Europe, but a large number are from applicants in India, and the field covered is a wide one, ranging from an artificial foster-mother for animals to a Himalayan timber-carrier. A substantial proportion of the applications relate to vehicles, railways and agriculture. A typewriter company applied for a patent for a new arrangement of the Bengali alphabetical characters and signs, and for adapting them to a typewriting machine. This machine is designed to write 360 characters with 46 type blocks and a single shift motion. Another inventor sought protection for an antidote to snake-bite, while two Indian gentlemen applied for patents for an "automatic coach."

Discovery of Nervous Impulse in Plants.

An important paper, announcing Professor Bose's discovery of nervous impulse in plants, was read at the Meeting of the Royal Society, held on March 6th. The universally accepted theory has been that in plants like the Mimosa, there is no excitatory impulse analogous to the nervous impulse in animals, the propagated effect being regarded as merely a hydro-mechanical disturbance. This conclusion was based on the experiments carried out by the leading German plant-physiologists Pferror and Halberlandl. They failed to arrest the propagated impulse in plants by scalding or by application of narcotics. Prof. Bose has shown the errors involved in these experiments. He has, moreover, by the invention of his resonant recorder, made the plant itself record the velocity of its nervous impulse, and the variation in that velocity under fatigue and under the action of various drugs. His new apparatus is of such delicacy that it measures automatically time intervals as short as a thousandth part of a second. Prof. Bose has, by interposing an electric block, arrested the nervous impulse in a plant in a manner similar to the corresponding arrest in the animal nerve. He has further been able by definite means to produce nervous paralysis in the plant, such paralysis being afterwards cured by appropriate treatment.

HEALTH AND HYGIENE.

Dust and Colds.

The dwellers in any city are liable to severe catarrhal affection in cold, dry weather, because the dust of the roads abounds in microbes that quickly set up inflammation of the fine lining membrane of throat and nose. The proof is clearly seen, says "A Physician," writing in the *Weekly Scotsman*, in the fact that country dwellers suffer far less than townsmen from throat and nose colds, and in a recent lecture delivered by the surgeon to Sir Ernest Shackleton's last Antarctic expedition, it was stated that the party escaped colds despite the temperature till one day a parcel of clothing was opened. Evidently microbes and dust were thus released that had come from England, and no sooner was the dust set free in the air of the tent than everyone developed a cold. Frequently when dry winds are prevalent, a cold will settle on a patient and resist all treatment till a change of air is prescribed, and then freedom from dust in the country or by the sea works an immediate cure.

Hard Water and Coffee, Tea and Cocoa.

A German scientist has been conducting a series of experiments for the purpose of determining the relative values of hard and soft water for cooking purposes.

He has found that if cocoa is made of soft water, a pleasant and rich drink is obtained which after short boiling deposits the cocoa powder. Even if the cocoa is made into a paste with a little water and the cup then filled with hot water, the largest part of the powder will precipitate, and the beverage will still be rich and pleasant. If, however, hard water is used, flakes will at once appear and the oil in the cocoa will be seen floating on the surface of the drink. The flakes will soon settle and the beverage is far less tasty than the one obtained with soft water. In the preparation of tea, the hard water causes the formation of a thin film. Hard water is equally bad for coffee making, as in this case also it cannot extract all the virtues from the raw material.

Nutritive Value of Rice.

Mr. C. Drieberg, writing to the *Ceylon Observer* on the nutritive value of rice, says :— *The Journal of the Chemical Society* for October last has some interesting information with reference to the importance of *Oryzanin*, a substance present in the husk of rice. The investigations made went to show that hens, doves, mice and dogs, fed exclusively on clean rice, fell ill and eventually died. The cause of death is said to be malnutrition—resulting in great loss of weight—due to the absence of Oryzanin which is considered essential to proper nutrition. Inefficient diets of fats, proteids, carbohydrates and salts were rendered efficient by the addition of Oryzanin. In the case of the dog, the addition of 3 grains of this substance to a diet which did not contain it brought about quick recovery after a period of wasting away. Oryzanin is said to be fairly well distributed in various foodstuffs.

A Milk Diet.

An entire milk diet is an excellent thing for the woman who is troubled with insomnia. It is also good for the one who is so nervous that when she does sleep, she has the sensation of falling, and wakes with a terrific start. When these conditions exist, it is well, says the *Family Doctor*, to subsist on milk alone for some time. A grown woman should take a pint of milk as a meal, but to keep up her strength she should take four meals a day, instead of the usual three. People with weakened nerves require a larger quantity of water than those whose nerves and brains are strong. Water aids the digestion of food by making it soluble, and seems to have a direct tonic effect. Fish of all kinds is an excellent food for woman who are suffering from nerves while, as a rule, salt meats should be avoided. Good bread, sweet butter, and lean meat are the best foods for the nervous. Eggs may be sparingly partaken of, but they should be thoroughly well cooked ; the common opinion that raw or underdone eggs are good for weak or ill people is an erroneous one.

HINTS AND RECIPES.

Removing Onion Odour.

If the hands are washed with ground mustard and water after peeling onions or handling fish, the disagreeable odour will be removed. Washing the hands in a little strong vinegar will also prove effective, or holding them in the smoke of a burning paper after they have been thoroughly cleaned with hot water and soap is also excellent.

Ink Faded Manuscripts.

Written manuscripts and letters which are undecipherable, or partly so, owing to the fading of the ink, may be made readable if the characters are brushed over with a feather or a camel-hair brush dipped in tincture of nutgalls. This easy progress will bring out the writing as clear as if newly penned.

Naphthalene as Insecticide.

The question as to whether naphthalene is to be recommended as an insecticide is discussed by two French scientists. This substance is commonly sold in the shape of small balls and is used in households, especially for preserving furs or various fabrics, but it appears that after being a favourite its use is falling off. They find that the toxic effect only takes place in a confined atmosphere and its action is slow. Furs or garments should be thus preserved in as tight receptacles as possible. It can also be used in horticulture in greenhouses for protecting against aphides and the like, but it appears to have no effect upon earthworms.

Restoring Hardened Rubber.

Every one is familiar with the very undesirable change to which rubber is subject on prolonged standing, such articles as rubber tyres becoming hardened and brittle. There is a simple process by which this trouble may be remedied providing it has not gone too far. This consists in immersing the articles for a short time in an alkaline solution composed of one part of ammonia to two of water. As an example of the efficacy of this process, an old bicycle tube which seemed beyond restoration was found quite fit for use after half an hours immersion in such a solution. In explanation of the effect it is supposed that there is a tendency for acids to be formed in the rubber, and that these acids are neutralised by the alkaline solution. On the strength of this it is suggested that when tubes or other rubber articles are stored, a small quantity of quicklime or ammonium carbonate be included in the wrapping, though it could be kept from actual contact with the rubber. Periodic washing with ammonia and water is also suggested as a preventive.

Sugar for Flowers.

New York is greatly interested in the announcement of the success of experiments in keeping cut flowers alive for many days by adding sugar to water. The cut flower trade in the United States amounts to about £4,000,000 a year, and it is computed that the discovery will tend to reduce the bill by over £1,000,000 a year.

Experiments lasting three years, led, says the *Express* New York correspondent, to the discovery, and further trials are to be carried out by one of the American universities. One hundred varieties of flowers have been tested, each in one hundred different solutions of various mineral and organic substances, but it is claimed that for the vast majority of the flowers a solution of water and either granulated, castor, or cube sugar is the most beneficial Three kinds—lilac, lilies, and sweet peas—suffer from the solution, while three others—marguerites, chrysanthemums, and tulips—derive no apparent benefit. All the others live longer, and in some cases their life as cut flowers is trebled.

Great care is, however, necessary in securing the right solution. Not less than two per cent. and not more than twenty per cent. of sugar in the water is found to be the outside limit. With fifteen varieties of carnations, a fifteen per cent. sugar solution was helpful. With forty-five varieties of roses, a solution of from seven to ten per cent. of sugar prolonged life. Forget me-nots lasted thirteen days in unchanged water, seventeen days in water changed each day, and twenty-two days in a ten per cent. solution of sugar.

LITERATURE.

Gardening by Dynamite.

I cannot dig, at any rate
I don't intend to do it ;
One gets in an exhausted state
Ere one is halfway through it.

But yet my garden I shall till
By methods more exciting,
You'll hear of me, indeed you will,
When I go dynamiting !

You put a cartridge in the earth
And fill the little pit up,
And simply sprint for all you're worth
When once the fuse is lit up.

Then comes a burst of thunder sound,
And earth in great amount is
Incontinently spread around
O'er all the neighbouring countries.

Your house may possibly be wrecked,
Your neighbours' windows broken,
And they may possibly object,
And heated words be spoken.

But still it serves, you may explain,
Their nerves to brace and harden,
And it improves what beds remain
(If any) in your garden.

C. E. B. in *Worlds Work.*

Indian Blue-Books.

In former days the India Office paid for all copies of Command papers relating to India taken for official use at the face value, less trade discount. But an unsatisfied treasury "asked for more." Its claim of 35 years ago that, besides paying for copies, the Indian revenues should be charged with a moiety of the printing charges for such Command papers was, however, successfully resisted, and the principle was established that all Parliamentary papers should be printed at the expense of Parliament. Some years later, an auditor discovered that this principle was being infringed by a then recent arrangement whereby certain financial papers first published in India were there printed in sufficient quantities to allow of the requisite number of copies being sent to England and put in the familiar blue covers for presentation to Parliament. For a time, the practice was discontinued in the case of the Railway Report, which was thus set up both in India and in England, consequently being presented to Parliament many months after publication in India. The question was settled finally in 1897 when the Stationery Office agreed to defray the cost of paper, presswork and freight to London of copies furnished from India for public use. In this way, the Stationery Office is a good customer of the Government of India Press, notably in the case of the Budget Statement and Discussion and the Railway Report. The quinquennial Education Report is similarly dealt with. In respect to papers set up in the first instance at the India Office Press for confidential use, and which are subsequently made public by presentation to Parliament, the Stationery Office pays half the cost of composition, in addition to the cost of paper and presswork. In this way, needless expense is saved both to the Treasury and the Indian Exchequer and papers are published much more promptly than was possible under the old system. There is also an arrangement under which papers relating to India set up in this country and presented to Parliament are gratuitously supplied to the India Office to the extent of 100 copies *plus* five additional copies which may be asked for without payment. Any further copies are sold to the Office at trade rates. Six copies of all Command papers, whether relating to India or not, are also gratuitously supplied. Whatever may be said in criticism of some of the financial relations between India and Whitehall, there is no ground, says the *Times of India*, for complaint as to this arrangement.

STATISTICS.

Population of the Madras Presidency.

We find from the Madras Census Report that the total population of the Madras Presidency in 1911, excluding Feudatory States, was 41,405,404, the increase since the census of 1901 being 3,175,750 or 8·3 per cent. as compared with 7·2 percent· in the previous decade.

The following table shows how the census figures of 1911 compare with those supplied by the statistics of births and deaths with corresponding details for the two preceding censuses :—

——	Increase of population according to vital statistics.	Increase of population according to census.	Percentage of column 2 to column 3.
1	2	3	4
1891 ...	2,423,133	4,803,327	50 per cent.
1901 ...	2,467,731	2,568,722	96 ,,
1911 ...	2,797,197	3,175,750	88 ,,

If regard be had to the fact that the loss to the Presidency by emigration greatly exceeds the gain by immigration, it is clear that the registration of vital statistics still admits of considerable improvement.

The average density of the population rose in 1911 to 291 persons per square mile against 269 in 1901 and 251 in 1891, and excluding the Agency tracts and Native States and the small Anjengo Settlement, was, as in 1901, highest in Tanjore and Godavari (634 and 568 respectively) and lowest in Kurnool and the Nilgiris (123 and 118 respectively). The distribution of this increased pressure between urban and rural areas was however noticeably different from that revealed by the previous census. The urban population showed an increase of only 15 per cent. in 1911 as against 25 per cent· in 1901. while the rural population increased by 8 percent. as compared with 5 per cent. in 1901. Mr· Molony attributes this to the fact that the seasons from 1901 to 1911 having been on the whole much more favourable to agriculture than during the previous decade, the steady demand for the labour most congenial to him checked the growing tendency of the Indian villager to seek to better his fortunes in the towns. It must also be remembered that urban areas so called are largely artificial creations and that residence in them does not necessarily connote a divorce from rural avocations.

Production of the United Kingdom.

The final report on the first census of production of the United Kingdom (1907) tells us that the gross output (selling value or value of work done) in England and Wales was £1,490,000,000 ; Scotland, £208,000,000 ; Ireland, £67,000,000 ; the United Kingdom £1,765,000,000. The cost of materials used was £1,028,000 in the whole of the United Kingdom. The net output (excess of gross output over cost of materials and amount paid to other firms) was £712,000,000. The average number of persons employed was 6,984,976. The net output per person employed was £102. The total horse power of engines at factories, mines, etc., was 10,755,009.

England's Foreign Trade.

In thousands of pounds (000 omitted).

	Imports. £	Exports. £	Excess Import. £
1891	435,441	309,114	126,327
1892	423,794	291,640	132,154
1893	404,688	277,138	127,550
1894	408,345	273,786	134,559
1895	416,690	285,832	130,858
1896	441,607	296,389	145,218
1897	451,239	294,184	157,055
1898	470,604	294,010	176,594
1899	485,076	329,680	155,396
1900	523,633	354,551	169,082
1901	522,239	348,346	173,893
1902	528,860	349,350	179,510
1903	542,906	360,447	182,456
1904	551,362	371,139	180,223
1905	565,279	407,822	157,457
1906	607,987	460,836	147,151
1907	645,904	518,176	127,728
1908	593,141	456,885	136,256
1909	624,741	469,745	154,996
1910	675,008	536,645	138,363
1911	677,302	560,542	116,760